DOCUMENT RESUME

ED 245 668 IR 011 159

TITLE	Telecommunications and the Schools. A Report to the Corporation for Public Broadcasting.
INSTITUTION	Designs for Education, Concord, MA.
SPONS AGENCY	Corporation for Public Broadcasting, Washington, D.C.
REPORT NO	ISBN-0-89776-087-5
PUB DATE	83
CONTRACT	5472/7054
NOTE	152p.
AVAILABLE FROM	Corporation for Public Broadcasting, 1111 Sixteenth Street NW, Washington, DC 20036 ($5.00 per copy).
PUB TYPE	Information Analyses (070) -- Reports - Evaluative/Feasibility (142)
EDRS PRICE	MF01/PC07 Plus Postage.
DESCRIPTORS	*Computers; Curriculum; *Educational Radio; *Educational Television; Futures (of Society); Institutional Characteristics; Interviews; Media Research; Public Television; *School Role; Teachers; Technological Advancement; *Technology Transfer
IDENTIFIERS	*Computer Uses in Education

ABSTRACT

This study assesses problems and possibilities associated with production and use of radio, television, computers, and various other technological delivery systems for instruction, and evaluates those already in place. Sources for data included commissioned papers; structured interviews with users, producers, and shapers of instructional telecommunications, as well as with educational leaders and opinion makers; a panel of experts convened to respond to both the papers and the interview reports and questions; and the knowledge and expertise of Designs for Education staff. Following a study overview, findings are presented in detail, organized around seven major themes: school and society, the school as an institution, technology and the school, curriculum, learning and technology, teachers and teaching, and resources and inter-institutional relations. A brief discussion of the findings and conclusions are provided. Finally, study conclusions are examined from a more global perspective, using the interpretations and reflections of the Designs for Education management team, in order to provide a more cohesive view of the disparate issues and themes. Discussion includes a look at the context of current schooling, predictions about the future, and speculation on the promise of telecommunications in education. Appendices include summaries of selected background and position papers, a summary report of the interviews conducted, an outline of the concerns of the analysis panel, and background information on the research team. (LMM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

- Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

ED245668

TELECOMMUNICATIONS AND THE SCHOOLS

A Report to the Corporation for Public Broadcasting

Contract Number 5472/7054

Designs for Education
Concord, Massachusetts 01742
1983

IR011159

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Eleanor C. Miller

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Corporation for Public Broadcasting
ISBN: 0-89776-087-5

Table of Contents

I. INTRODUCTION 1

II. FINDINGS, DISCUSSION, AND ANALYSIS 7

III. INTERPRETATION AND REFLECTIONS 51

APPENDIX A: SUMMARIES OF POSITION PAPERS A1

APPENDIX B SUMMARY REPORT OF INTERVIEWS CONDUCTED FOR THE STUDY B1

APPENDIX C CONCERNS OF THE ANALYSIS PANEL C1

APPENDIX D BACKGROUND - MANAGEMENT TEAM D1

The opinions expressed in this report are those of the authors and do not necessarily reflect the views of the Corporation for Public Broadcasting.

FOREWORD

> Public broadcasting and education share a common heritage and purpose - to contribute to the educational progress of the nation. The Corporation for Public Broadcasting sees the relationship between the public broadcasting licensees and local education institutions as fundamental to the educational role of CPB and public broadcasting.
>
> The Corporation recognizes its special mission to seek ways in which educational television and radio can more effectively contribute to meeting the needs of learners as an integral part of an educational service, both formal and nonformal, to the American people.
>
> A major mission for CPB is to support the development, production, distribution, and promotion of educational material that will contribute to growth for learners of all ages...*

In the pursuit of this statement of mission and goals, CPB has provided support for many instructional television programs. For example, CPB has supported the work of the Children's Television Workshop, which developed many other programs in addition to the famous SESAME STREET. Another was THINKABOUT, the Agency for Instructional Television's (AIT) series in reasoning and study skills for fifth and sixth grade classroom use which was co-funded with 42 state and provincial agencies. Since 1979, when CPB first asked for proposals for programs, it has allocated $1 million each year for the production of instructional television programs. Among the fourteen projects selected for production between 1980 and 1982 were COMMUNITY OF LIVING THINGS, a classroom series of fifteen

---

* From CPB's Mission and Goals Statement, June 24, 1982.

15-minute TV programs in life science for grades six through nine, produced by WHRO-TV, Norfolk, VA (1980); THE ARTS EXPRESS, twenty 15-minute programs in arts education produced by the Kentucky Authority for TV (KET) for grades two through four covering visual arts, music, and dance (1981); and OLD ENOUGH TO CARE, a series of six 15-minute programs on perspectives and issues of aging, for grades eleven to twelve, produced by WCNY in Syracuse, New York (1982).

Production of programs does not, however, ensure that they will reach the audiences intended. Clearly, CPB has an interest in the use of programs made available for instruction, in increasing their use, and in identifying areas where new instructional materials are necessary. To further these ends, in 1982-83 CPB is conducting its second nationwide quantitative study of school use of television in collaboration with the National Center for Educational Statistics (NCES). Reports will be available from the Corporation for Public Broadcasting in early 1984.

Prior to launching the new School Utilization Study, CPB contracted with Designs for Education (DFE), an educational services organization, to assess from several vantage points the problems and possibilities connected with the production and use not only of television but of other technological modes of reaching students. What follows is a report of DFE conclusions in this regard. In the belief that this document will be useful to others, CPB is making a limited numer of copies available.

TELECOMMUNICATIONS AND THE SCHOOLS: A Report to The Corporation For Public Broadcasting

INTRODUCTION

Purpose, Methodology, and Assumptions

In October, 1981, Designs for Education, an educational service organization based in Concord, Massachusetts, undertook an eight-month study for the Corporation for Public Broadcasting (CPB). The purpose of the study was to provide a qualitative assessment of the relationship of telecommunications and the schools so that the Corporation for Public Broadcasting might have a base for future policy planning with respect to instruction in the schools. Telecommunications is a generic term meaning programs to be transmitted over such "hardware" as television, radio, computers and the like, and the devices which permit interaction.

The study makes no claim to be a comprehensive, definitive, or methodologically precise survey of the fields of either education or telecommunications. However, it is conceptually sound and reflects accurately the judgments of many of the most capable and thoughtful experts in these areas in the country.

The methodology consisted essentially of collecting information and opinion from a variety of sources, namely:

o Commissioned papers on six subjects: The School and Society; The School as an Institution; Curriculum; Teachers and Teaching; Schools and Technology; and Technology and Learning. These subjects were identified as having some logical relationship to the planning, production, and use of instructional television/technology. (Summaries, Appendix A)

- A series of structured interviews with users, producers, and shapers of instructional telecommunications, as well as with educational leaders and opinion makers. (Appendix B)

- A panel of representative experts convened to respond to the papers and to a set of interview reports and questions used for the interviews, from the point of views represented by their positions; namely, policy makers, practitioners, and researchers and developers. (Appendix C)

- The knowledge and expertise of the management team of Designs for Education (DFE), who have experience in the design and development of instructional television, in curriculum and instructional theory and practice, in teacher education, and in the administration and management of schools and telecommunications at both national and local levels. The DFE team was grateful also for occasional briefings from a representative from the Corporation for Public Broadcasting's Education Division. (Appendix D)

- A survey of selected literature.

One of the chief tasks of this study was conducting the interviews, which were among two distinct groups. The first set of interviews was with representatives of both the users and producers of telecommunications for both public and private schools--the practitioners or field people, as it were. The second set of interviews was with persons who represent national organizations and leadership in the fields of curriculum and instruction.

The structured interview used was designed to elicit fundamental information concerning the following questions:

1. What curriculum emphases are currently in place?
2. What do you believe the curriculum emphasis will be in 3-5 years in your setting? Why do you think so?
3. What do you think causes teachers to decide to use instructional television/technology as a tool of instruction?
4. What do you think prevents them from making such a choice?
5. If teachers do select instructional television/technology to use as part of the instructional program for which they are responsible, are there preferred lengths of programs, lengths of series, subjects, approaches, ancillary materials?
6. What ITV/Technology could be used to enhance or reinforce the current curriculum?
7. What ITV/Technology do you use or recommend for use to enhance/reinforce the current curriculum?
8. How should/could you select the ITV/Technology you use that would be different from current practice?

To validate the data obtained from the interviews and contained in the position papers, a panel of knowledgeable persons was convened to react to this material. The comments and concerns of the Analysis Panel then became a part of the study findings.

From the data sources described, there emerged two separate reports. This--the first report--focuses on the findings gleaned from the data sources noted above. These findings are listed and discussed in Section II in a research-oriented style and presentation.

Section III of this report examines the conclusions resulting from the study from a more global perspective, attempting through the interpretations and reflections of the management team to make a cohesive whole out of disparate parts. Some readers may prefer one style of presentation rather than the other; some readers may wish to look at both sections.

A series of appendices which give details about data sources are available for people wishing to examine the evidence more thoroughly. They have been routinely added to the reports going to those people who were interviewed and those who served on the Analysis Panel. Persons wishing to examine the evidence more thoroughly may write for the appendices to Designs for Education, Concord, Massachusetts 01742.

The second (not yet published) of the two reports builds on the findings and addresses the main goal of the original study in a more technical fashion. It considers the criteria for decision-making at different levels affecting the school system in accordance with a conceptual framework outlined by Ralph W. Tyler and John I. Goodlad. The framework is described and illustrative criteria are developed for the different levels of decision-making included in the Tyler-Goodlad scheme--ideological, societal, institutional, and instructional.

In addition, a hypothetical case study is also described to illustrate the decision-making model in action. This model is intended to put the criteria to work in the planning, production, field-testing, and implementation stages of introducing the material into a school curriculum.

The second report is addressed to those who are directly involved in telecommunications for the schools. As noted, it tends to be more technical than the first report. It is, in short, a kind of guidebook for those who are active in the field and who must plan and implement any development and use of telecommunications in curriculum and instruction.

Some simple but basic assumptions about schools and telecommunications form the foundation for the rationale and approach to the study. The first is that schools--and that includes teaching--are complex entities which are little understood despite the length of time they have been around. A second is that the design and function of schools are intimately related to the society they serve. A third assumption relates to a lack of qualitative knowledge about the acceptance, value, and use of instructional television/technology in the schools. A fourth takes for granted the pervasiveness and ubiquity of TV as a culture molder in our society and uses it as a background for this initial study of the problem of making sensible judgments about instructional television/technology. A fifth assumes that the building of a tentative framework for decision-making is a possible and achievable task.

Out of these assumptions grew a working clarification of the task ahead of us. The original purpose of the study acquired two subsections, namely:

(1) To increase knowledge regarding the relation of instructional television/technology to ongoing instructional programs in schools and other educational settings; and

(2) To provide the framework for decision-making for instructional television/technology in educational settings.

The following section will discuss how and what was accomplished in the pursuit of the first of these purposes.

II. FINDINGS, DISCUSSION, AND ANALYSIS

This section of the report presents the findings of the Designs for Education study of telecommunications and schooling. It is organized around seven major themes: 1) school and society; 2) the school as an institution; 3) technology and the school; 4) curriculum; 5) learning and technology; 6) teachers and teaching; and 7) resources and inter-institutional relations.

Under each theme, a series of statements indicates major findings culled from various data sources. Following these statements, there is a brief discussion of the findings and conclusions.

School and Society

- Schooling and politics (national, state, local) are inextricably interwoven.
- Schools have been given (and have taken) a great many new tasks during the past generation.
- Schools are vulnerable to special interest groups whose members apply political pressures.
- Schools are in trouble (negative image, increased demands, social changes exerting pressure, changes in student population, changes in family and community, changes in teaching population, changes in roles and functions of teachers).
- Schools are under increased pressure related

- Schools are under increased pressure related to accountability.
- It is unlikely that schools can change the social order.
- There is a lack of consensus about what schools should do.
- Schools are more often followers rather than leaders.

There has been a persistent belief that schools as social agencies can and should lead in the promotion of positive change in the greater society. Despite this belief, it has become increasingly clear that schools do not usually lead, they follow. This can be seen in the schools' response to special interest groups' demands, state and local agencies' installation of teacher and student accountability systems subsequent to widespread public discontent over declining standardized achievement scores, the return (in some parts of the society) to a relatively fundamentalist belief in how the individual should relate to social institutions, and so on. And, in the arena of telecommunications, it can be observed that technological advances are more often observed in settings outside the school than inside it.

A consequence of the schools' relative passivity has been the inclusion in school programs of a variety of offerings and functions which move into and out of classrooms depending upon the socio-political currents of the day. Examples of the phenomenon would include sex and family life education (or lack thereof), bilingual education, education of the handicapped, driver education, economics education, the "new" math, feeding programs, vocational education, remedial reading and mathematics, and, yes, computer literacy. Each of these program requirements had (or does have) its proponents in the broader society. The ease with which they and others like them move into the school setting is a function of the fragile and largely unexamined relationship of the school to the society it serves.

The principal issue here is not that schools adopted programs of instruction which school leaders believed to be important and necessary, but that the initiatives for including such programs most often came from outside the school. In certain ways, then, the school is a reactive institution despite the continuing rhetoric about its perceived role as a proactive organization.

Several outcomes of this reactivity are that school programs and school functions have become fragmented, the schools' status have declined in the eyes of the public, and leadership within the schools seems to have focused upon preserving the status quo rather than upon providing internal leadership for positive change. These conditions account for the instability of foci for leadership, the relatively low esteem in which school people are perceived by the public as well as by themselves, the "don't make waves" mentality, and the persistent vulnerability of school persons to public intervention (ideological and instrumental). And so, we come full circle from vulnerability to vulnerability.

The intention of this discussion is not to pour the blame for social ills upon one social institution--the school--but to provide a basis for understanding the difficulties associated with promoting educational change. Change here is defined as planned, systematic change--not haphazard, politically reactive change. And, the use of telecommunications as a central and demonstrably valuable resource for teachers and students continues to be an institutional change which has only intermittently taken hold in school settings.

The School as an Institution

- Schools are complex human and social organizations.
- All school persons need continuing education.
- There is a lack of congruence between levels of decision-making in the school system.
- The institutional level of decision-making in schools has had relatively little influence upon instruction.
- Policy decisions have paid little attention to telecommunications as a powerful school resource.
- Pressure for school accountability can result in policies and practices which positively influence the use of telecommunications by teachers and students.

To state that schools are vulnerable to public pressure and changing public whims is not the same as saying that schools do not have formal and informal characteristics which can be identified as either positive or negative in terms of the health of the organization. Schools are complex institutions, if only in the numbers of persons to be managed, the problems of creating orderly environments, and the network of decisions that must be made to keep even "business as usual" going. At issue here is how this complexity manifests itself within the school and how the use of telecommunications intersects with that complexity.

Certain properties of public schools can be inferred to magnify the complexity issue. Among these are the involuntary character of the client population; the low levels of professional status of the workers; the lack of clarity in terms of expectations; the relatively sparse knowledge base, although this is changing more rapidly than in times past; the lack of coherence among various levels in the organization (e.g., managerial vs. policymakers vs. workers); and so on. These properties argue for a pulling together of the components of the organization--the development of cohesion, but not necessarily uniformity.

The management team's contacts with school persons and its understanding of many of the points made by the authors of commissioned papers suggest that the use of telecommunications in schools has suffered because of the conclusions presented above. Policy makers may mandate the use of ITV, for instance, but then there is little provision for monitoring and for providing systematic assistance to teachers as they do, or do not, follow the mandate. Management persons often are exactly that--managers rather than instructional leaders. Principals, caught up in paperwork, may find it difficult to keep abreast of their fields of expertise and/or interest. Distrust and occasionally fear fill in the interstices of the organizations--teachers against principal, principal against superintendent, superintendent against Board of Education. Although peopled largely by persons of good will, schools simply do not follow rational guidelines for maintenance or improvement.

Though inherent in the argument above, it is important to state that there appears to be little evidence of instructional action beyond the classroom level. Managers in central offices and principals in schools are supposed to coordinate the efforts of the organization and lead it forward to some desireable goals, yet often the institutional level persons tend to get bogged down in bureaucratic entanglements rather than engaging in substantive or pedagogical deliberations.

This identifies a need for staff development. Indeed, our school contacts, the Analysis Panel and their experts repeatedly called attention to this need. Certainly, it is not the job of the Corporation for Public Broadcasting to provide learning opportunities for school persons in a generalized fashion--across the board. But it seems reasonable and important that the implementation and effective use of telecommunications in schools will be affected by the degree to which opportunities to understand, test out, and reflect upon telecommunications as an instructional resource are provided as a corollary to the introduction of such a resource into this complex system.

Currently, schools are under considerable pressure to provide evidence that what students are engaged with makes a difference in their intellectual, personal, and social lives. This movement is commonly called the accountability movement. Many school persons believe that this increased attention to teaching and learning effectiveness can be used as a positive force for the support of telecommunications in classrooms. As has been noted with other instructional resources, the degree to which the resource can be shown to respond to a perceived need in the school will directly relate to the degree to which that resource is used. This relationship cannot be blindly assumed--it must be planned for in the initial as well as final stages of production and implementation. This planning must include the preparation of the system (staff development) for receiving the product.

Technology and the Schools

- There is confusion about access to and availability of hardware at different levels of the school system.

- Such technical equipment as exists in schools is often out of date (e.g. black and white receivers).

- The provision of instructional television by public television stations over open channels to schools is diminishing in some areas.

- Although scheduling has been a persistent issue, teachers continue to report that ITV offerings are not convenient in terms of school and classroom rhythms.

- The development and production of quality instructional television is costly.

- It is believed that high quality ITV will be produced as a consequence of strong and healthy organizations devoted to programmatic development rather than by scattered and small scale production centers.

- Available resources for ITV are scattered and, to a degree, not known about by users.

- There are misconceptions about rights and clearances in regard to the reproduction and use of telecommunications products.

- There is confusion about the use level of ITV and the quality of that use in schools.

- Teachers find it difficult to take time to prepare support materials to accompany instructional television.
- Children and youth are already (in some numbers) sophisticated and knowledgeable about computers and other technology now used for entertainment and/or games.

- School leaders will use telecommunications much more readily if the product is accompanied by evidence that it does what it is intended to do (i.e., research).
- School people and some telecommunications people are intrigued by the possibilities of the use of computers in schools.
- Computer software appears to be primarily drill and practice-oriented.
- Computer literacy is perceived as a social (and, therefore, school) need.

The success of an excellent instructional television program is dependent upon the degree of excellence in each and all of the following: 1) the delivery system bringing the program to the classroom; 2) the reception equipment within the classroom; 3) the program and its ancillary materials; and (4) the activities of the classroom teacher to integrate the ITV program into the on-going learning experience.

Each of these components as listed above has a long, complex and sometimes haphazard history of development. This narrative intends to deal with each and to identify complexities accompanying the latest technological tool to appear on the educational scene: the micro-computer.

Spurred by the availability of federal NDEA and Title I funds, equipping schools with television receiving components necessary for classroom use was, at best, a spasmodic, informal local activity. Salesmen from competing manufacturers, knowing of this source of funding from the mid-Fifties through the Seventies, encouraged naive educators to sign on the dotted line as quickly as possible.

Only later did educators realize that components from different manufacturers were incompatible or that the equipment purchased would not provide the kind of service they had envisioned or needed. State Departments of Education were hampered by policy or law from recommending kinds of equipment best suited for school use. Some states, hoping to make large purchases to assist schools, passed legislation requiring that contracts go to the lowest bidder--no guarantee that schools would receive the best equipment.

Locally, television sets were purchased by PTA's and other interested groups as well as school boards. Some school budgets allowed the purchase of a greater number of 17" monitors than 21" in an attempt to spread instructional television as broadly as possible among classrooms. The smaller screen monitors proved inadequate for classroom viewing. Convinced that only they could develop programs that would meet their needs, educators turned classrooms into "studios", purchased vidicon cameras of varying degrees of sophistication, and experienced deep disappointment when their expectations of quality productions crumpled under technological incapacity.

History repeated itself when portable video tape recording equipment became available. Salesmen sold recorders with the strong pitch that schools could now record off the air, stockpile tapes, and could dispense with support of the local ITV service. Copyright law and teacher contracts for ITV programming were ignored. Once again, tape recorders proved incompatible and greatly increased costs of making available programming in the needed mode.

And so, for the most part, school systems entered the Seventies with a hodgepodge of television receiving equipment, some of which had been relegated to storage. Color television had made its appearance but school districts, especially those in metropolitan areas, found that their ITV budgets were inadequate mainly because they were eaten up by the need to replace black and white sets either stolen or destroyed by vandalism.

This diversity of amounts and kinds of receiving equipment persists today. Some buildings are equipped with all color sets. Some have building distribution systems to assure good reception in each room. Many have one or more video tape recorders, mostly in the secondary schools, but there is still incompatibility among them.

Generalizations about the amount and quality of receiving capability are impossible to make with any degree of integrity. Research to date indicates that the majority of this nation's classroom television receivers are old black/white sets. With one exception, all of those interviewed wished that each classroom could be equipped with a color monitor and have instant access to a videotape playback machine. One school district which made a concerted effort to place color sets in its school reported an increase of 71 percent in ITV use.

The development of delivery systems to schools has been almost as chaotic as that within schools. Most schools received, and continue to receive, an open broadcast signal from the local public television station (PTV). This delivery system, for most, limits reception to one program choice at any particular moment in time over one open broadcast channel. This can be further complicated by the fact that many PTV stations are licensed to operate on ultra high frequency (UHF) channels, which require good master antennas for satisfactory reception, which are unavailable in many schools. Other schools relied upon media centers to deliver tapes or films, either by truck or over their own closed circuit or Instructional Television Fixed Service 2500 megahertz (ITFS) systems.

In some states, the expense of such diversity led to the establishment of Educational Television Commissions or mandates to State Boards of Education to develop delivery networks making educational television available to all citizens. During the Seventies, such networks grew with alacrity and continue to grow, employing various schema of open broadcast, closed circuit land lines, microwave, and ITFS technology. Of the four states focused upon in this study -- New Hampshire, Wisconsin, California, and South Carolina -- the two statewide systems (Wisconsin and South Carolina) appear to have the most organized and best utilized television services to schools.

Cable companies were seen as additional means of providing alternative schedules, adding to the flexibility of choice for teachers. Some school systems were most active in working with local franchise developers to assure this service. Others gave this activity a low priority among the press of demands during the Seventies, particularly because the FCC made frequent changes in its policies toward cable services.

Bitter experiences of the past made educators move more cautiously in this whole field of technology. The rapidity with which cable companies have grown once Federal Communications Commission (FCC) regulations eased and satellitic services to cable systems became feasible, have added more problems to servicing schools through cable. For example, several different companies with different channel capacities may be functioning within the same educational community, thereby making coordination of effort and scheduling difficult. And in many instances, school administrators are reported to be uninformed and inactive in the development of cable franchising in their communities.

The development of instructional television programming has reflected the potential of the available technology at that time. Initial programming was limited to school communities within the signal reach of the local public television station. Local school systems were heavily and intimately involved in the development of the programming service. Concurrently there was an ever-growing awareness of the duplication of effort and varying degrees of quality among programming being developed within one state or one region. The advent of video tape made possible the structuring of regional networks for the exchange of programming and the collection of course materials within local, regional, and national libraries. Media centers were developed, and by the mid-Seventies, the Public Broadcasting Service (PBS) national network service provided some assistance in serving schools. By 1980, regional networks were working together to coordinate ITV schedules which could be delivered nationwide by satellite.

These cooperative efforts have proven to be efficient and cost effective, thereby releasing amounts of the modest funds available for investment in producing or acquiring programming of quality. There are few school systems today that feel local needs must be met by local productions. Teachers and students are far too sophisticated in their television tastes to be attracted to well-meaning, amateurish, low-budget programming. Program series are now developed internationally by consortia of educators who give both curriculum expertise and funds to enable producers to develop outstanding programming of quality with budgets in the millions of dollars.

Each of these developments--the advancement of technology for delivery and reception, the greater abundance of programming selection, and the increasing costs of producing programming of quality--has exacted a price of the classroom teacher. Initially very involved in the development of local programming, the present day teacher, consciously or unconsciously, senses a lack of complete control over the learning experieces for which he/she is being held accountable. More complex, sophisticated uses of instructional technology require the professional expertise of others not involved in teaching, people largely unseen and unknown by the classroom teacher. Programming developed by widespread consortia of educators result not only in quality programming, but also in the need to reach the classroom teacher with a thorough instruction in how best to use the materials. Distribution mechanisms developed regionally and nationally and national distribution libraries are not fully understood by the classroom teacher, and he/she senses that there are helpful materials out there of which he/she is unaware.

The new copyright law enacted in 1977 brings new rules and regulations, particularly in the area of "fair use" within schools. Teachers are aware that lawsuits have been brought against school systems for infringements of the law, and their desire to do the right thing brings new anxieties.

In 1977, the NEA published a book, The New Copyright Law: Questions Teachers and Librarians Ask, to assist educators in complying with the law, promising to update it in five years when many unresolved questions might be answered. However, copyright allowances for educators continue to be unclear five years later.

Little wonder that most classroom instruction continues to be teacher, textbook, blackboard, pencil and paper. These are concrete, constant, permanent elements, easily accessible and always available.

Little wonder teachers do not use any more complex form of technological assistance unless it is readily available and in working order when they need it. It is no surprise that filmstrips are the most used instructional technology. They are packaged, simple to manipulate, and completely under the classroom teacher's control so far as timing and pacing is concerned.

Little wonder that the less competent teacher is threatened by the need to share his/her responsibility with so many variables under other control.

Little wonder, too, that the creative teacher relishes the challenge of additional outside stimulus that enhances both the teacher's and the students' understanding of the matter being studied.

Few educators are aware of the complexities the changes have brought to the public television professionals responsible for instructional television services. No longer responsible for total production of courses to meet local needs, new systems and processes have had to be developed to offer new types of service. Emphasis is now upon establishing and maintaining mechanisms and processes for educators to preview and select materials available from many sources, to coordinate ITV schedules with other agencies nationwide, to negotiate prices of acquired programming, to increase amounts of information for schools about rights to record and play back ITV series, and to meet the ever-increasing need to provide utilization assistance to teachers as new programming becomes available.

Local Teacher Guides are developed and distributed by the thousands each school year. Guides being made available from other sources have to be coordinated with local distribution processes. Registration and use data must be compiled, needs must be identified and funds must be found to provide the service. For the most part, these are not income-generating activities. They are non-income producing services dependent upon annual zero-based budgets, subject to the current concerns and priorities of the administrative powers controlling budgets. Program production is the only conceivable source of on-going income if there are others using the product and paying for acquisition. This, too, can be an annual question mark.

From the beginning, public television stations have assumed the major role in providing the development and production of ITV series, the delivery of the product, the ancillary materials and utilization services accompanying them. As income-producing program production decreases and non-income producing services increase, public television stations are finding that school financial support, though fairly constant, is not increasing as much as income from other audiences to be served. Therefore, the public broadcasting system as it has been forced to evolve in the United States must of necessity give highest priority to serving those who support it most.

There is a growing perception that school services from public broadcasting stations may be diminishing in some areas. This is a generalization of supposition and needs further study: it may be that schools are wanting more instructional television programming and support services than are financially feasible, and that the amount of service has not diminished, but may be inadequate for current needs.

This section on Technology and the Schools tells nothing new to ITV practitioners. The demand to serve a diversity of delivery and receiving systems, of scheduling complexities, of determining local school needs, of informing schools about program rights, of distributing maximum information in succinct form to teachers, of providing utilization services, of raising money; these are their daily concerns. There does not appear to be a lessening of school desire to incorporate ITV in their activities. Therefore, with the technology now available, it is imperative that educators assume a greater leadership role of responsibility in maintaining and improving the service to their constituency.

One last redundancy: The role of television in the learning process is still under debate. For the most part, all agree that ITV has proven a valuable supplemental, enrichment resource to classroom teachers provided it is available in the easiest-to-operate format, at the precise moment that the teacher needs it.

For some school administrators and school boards, this is not enough: they seek proof of substantive change brought about by television. At the same time, ITV is not allowed to assume the role of being an integral part of the delivery of core curriculum as it was in the earliest demonstrations of its teaching potential. Its success in instructing both teacher and student in those early days of daily presence in the classroom proved to be politically volatile, threatening less competent teachers with the prospect of being replaced by television--a bit of mythology which persists even today. Until educators allow instructional television programming to be developed as an integral part of core curriculum, it will continue to be peripheral to teacher, textbook, and blackboard. Substantive change does not occur with one fifteen-minute exposure per school week.

***

As history has proven, before one technology can be harnessed in orderly process for maximum efficiency, a new one appears on the horizon. Currently, computer-assisted instruction advocates are spouting the same hyperbole about its educational potential as was given by some over-enthusiastic proponents of television twenty-five years ago. As quoted in the March 31, 1982 edition of Current, enthusiasts estimate that 42% of all school districts "use some instructional computers and 19 percent use them in classrooms," and that "ITV is dying."

School administrators admit there is no budget item for television sets, but monies are found for computer purchase from PTA's and business sources: a familiar litany to many professionals. The argument is made that students are sophisticated in the use of computers and that home familiarity forces schools to adapt to computers. The same analogy can be made for television: students spend more time with television at home than they spend in school. Computer advocates are positive that the use of this new technology will bring cost-effectiveness into the teacher labor load. Instructional television promised and demonstrated the same claim, and was quickly relegated to an enrichment role.

Computer enthusiasts do admit that course development for computer-assisted instruction will be as costly as that for ITV and that main-frame computer terminals, serving one student at a time, may cost "under $3,000." The back-up delivery systems needed to make the computer instructionally interactive with the student can vary from $10,000 to $1,000,000, according to these same enthusiasts. Of course, micro-computers may be purchased for much less.

History appears to be repeating itself, bringing with it an even more complex set of technological, programmatic, utilization, communications and funding problems than those still challenging professionals who are daily involved in instructional television services. Most of them feel there is an urgent need to acquaint educators with computer state-of-the-art, the amount of programming available, cost-effectiveness in serving students, and careful analysis of need prior to purchase.

Having identified all these cautions, the majority of ITV professionals interviewed see microcomputers and computer-assisted instruction as an enhancement and further refinement of the instructional television equipment and programming now in place. Some feel that computers will motivate a resurgence of interest in, and use of, instructional television.

Curriculum

- Schools report growing gaps in their ability to deliver quality instruction in mathematics, science, and the arts.
- The quality of much of the curriculum in substantive areas like history, world affairs and the humanities tends to be mediocre.
- Current curriculum emphases are upon the basics, i.e., reading and the language arts, writing, and mathematics.

- Future emphases are likely to include higher mathematics, history and the social sciences (particularly civics, economics, and world affairs), and the physical and biological sciences.

Although it can be argued that schools are continuing to adopt more and more programs of instruction (as noted elsewhere in this report), this adoption has been at the expense of many of the historically valued components of schooling. It is important to realize that the school day, school year, and students' tenure in schools are limited and finite. Consequently, when schools expend time and energy on, perhaps, a socially desirable and/or politically motivated new content area, something must be pushed out of the school door to make room for it. And, coupling this phenomenon with the continuing pressure to expend more time on the so-called "basics," many areas which are valued as instructionally important by public and professionals alike have been abandoned.

Consider, for example, the state of history and the social sciences in the elementary school. Once the subject area around which other content and skill areas were organized, the social studies are now rarely seen in their potential richness and variety. Although social scientists and experts in education (particularly curriculum persons) continue to exhort the school to pay attention to students' understanding of themselves and their relation to their society, the humanities, history and the social studies have been replaced, most often, by more of the same "basics." Already mediocre, the curriculum in history, the social sciences and the humanities seem to be further watered down by the need to appease a variety of vocal pressure groups and to downplay controversial issues. The resulting offerings are often anemic and lacking in robust content, methodology, and scholarship.

Our study confirmed, to no one's surprise, the power of the "back-to-basics" movement. In case after case, school persons and school observers reported on the increased time given to the three R's, the allocation of resources to their pursuit, and the impact of policy decisions (even judicial ones) upon their presence in classrooms. At the same time, however, it was clear that these same informants were almost unanimous in their belief that this movement was cresting and, importantly, that school people were beginning to see the potential flaws in giving so much to one area of study (skill development) and so little to others (such as the humanities, world affairs, understanding human and institutional interactions, and problem solving).

An underlying theme of discussions about curriculum was the relative sterility of the offerings in schools (more true, perhaps, for elementary settings than for secondary ones, possibly as a consequence of differing organizational patterns and higher education prerequisites). It appears to us that this sterility will play out in the next several years and that both public and school people will re-examine the role of the sciences, the humanities, and the arts in both school and society. No one in our sample questioned the need for the tools of living and communicating, yet everyone argued for the need to conceive of schooling more broadly than as skill development.

It is important, as suggested above, that there not develop a dichotomy between the skills and what those skills are meant to accomplish for humankind. The need to equip young people with the human tools needed to move through the world is not in question, but there is also the need to acquaint the young person, in as direct and immediate a way as possible, with the problems, possibilities, and complexities of that world. A careful blend of skill and substance is called for.

Learning And Telecommunications

- Telecommunications can be powerful and effective tools for teaching and learning.
- Research on learning and personality theory, and on human growth and development, has been increasing, but remains slow to reach the practitioner and the public.
- Despite a lack of one-to-one correspondence between research findings and classroom practice, there are important teaching-learning implications to be found in learning and personality theory, studies of human growth and development, media theory and in new insights into the functioning of the brain. For example, it would be well to introduce new learning and skills at times in the development of children and youth which coincide with spurts of brain growth.
- Telecommunications has unique teaching-learning capabilities, such as the power to

motivate and the power to illustrate abstract ideas through series of concrete examples when these are featured by producers and by teachers as they plan the use of television with children and youth.

- Telecommunications, like all other learning tools, has its limitations. Wise use of telecommunications requires knowledge of both its strengths and weaknesses.
- Much more research on the effects of telecommunications on learners is needed.

There is no question but that television can and does teach. So also does the computer. George Comstock, Professor of Public Communications at Syracuse University, calls television "the second teacher" and hints that it may be "the third parent."[1] Even Neil Postman, Professor in the Department of Communication Arts and Sciences at New York University, though he would ban all television sets from the classroom, notes that:

> ...television has, by its power to control time, attention, and cognitive habits of our youth, inevitably gained the power to control their minds and character.[2]

Almost every subject in the curriculum at every level of learning has been taught via television, whether that curriculum be in regular schools or in universities or in the public domain or as part of the military-industrial complex. The computer as teacher is a relative newcomer, but when linked with video tapes and other newer technical devices, it adds even more potential power to the teaching-learning possibilities of telecommunications.

As parent and teacher, instructional television/technology can and should make use of the same knowledge about personality and learning theory, and about human growth and development, as does the designer of more traditionally mediated curriculum and instruction. Producers and users of telecommunications should likewise keep up to date with this large body of literature. Today, for example, an information processing approach to perception, learning, memory, problem solving, and decision-making seems to have taken center stage in place of the classic stimulus-response-reinforcement theories of behaviorism and the Gestalt psychology of perception, although the older ideas hang on rather strongly. Coding theory is aiding understanding of information processing as is, obviously, the computer. Indeed, computer and computer analogues in the hands of such research centers as the one at Yale University are helping us gain insight into how our language and our own minds work.

Equally important for the producers and users of curriculum and instructional design are studies of cognition, emotion, motivation, and personality development. They are indebted to psychoanalysis, to cultural anthropology, and to physiological psychology, as well as to more standard brands of the psychology of learning. Names like Piaget, Erickson, and Kohlberg come to mind, men who have given us greater understanding of maturational processes, and stages of cognitive, emotional, and moral growth--extremely valuable knowledge for parents and teachers as well as for designers and producers of programs. Studies of evolution also contribute to our knowledge of the educative process through emphasis on identification, on play, on powerful informal learning through close association with parents, with other adult members of the tribe, with peers, and on the adaptive functions of the long dependency period of human infancy and childhood.

A burgeoning area on the horizon is research into the nature and functions of the brain. The results of this research might not have an immediate application in the classroom, but they bring us much closer to understanding how the brain works and how, in the fullness of time, these abstruse researches might affect teaching and learning. The observation, for example, that the brain has three layers--three minds in one--is most provocative. The _reptilian_, the earliest formed in an evolutionary sense, is concerned with keeping the species and the individual alive and modulates such behavior as defense of territory, mating, establishment of rituals, and the formation and maintenance of social groups. The second layer, or _limbic_, is involved with experiencing and expressing emotion. The third and newest, the _neocortex_, is in charge of language and other symbolic systems, of the creation and preservation of ideas and concepts, and of planning for the future and insight into the feelings of ourselves and of our fellow creatures.

Another intriguing division within the brain is that of the two hemispheres, left and right. In a majority of human beings, the left brain controls logical and analytical thought, language development, a sense of time, and the movements and functioning of the right eye and the right hand. The right hemisphere is involved with intuition, creativity, spatial relationships, and simultaneous rather than linear and sequential understanding of events and phenomena.

Yet this description of the functions of the two sides of the brain is entirely too simple. The observations just made are not true for many left handed people nor for some right handed ones. Further, at times the two sides of the brain inhibit and at times support and complement each other. These paradoxical examples are not only reminders of differences in individual styles and approaches to learning, they also underline the complexity of the brain--much more complex than earlier investigators had imagined. In fact, the brain is far more complicated and sophisticated than the most advanced computer--to which it has often been naively compared. Indeed, despite the fact that there have been many advances in brain research during the past twenty years, there are not yet answers to the most important questions the educator has to ask.

At the same time, these new researches bring us new data to corroborate earlier observations about sex differences in brain function. In general, girls do excel in language, in fine motor performance, and they have greater sensitivity about social relationships and events. Boys, on the other hand, are more proficient at tasks requiring visual and spatial acuity, and in activities involving large muscle coordination and manipulation of objects.

There are also findings about brain growth and maturation which have immediate implications for education, such as the finding that environment can change growth processes in the brain, particularly in the very young. The fact that the brain seems to be stimulated by novelty raises questions about the amount of rote learning found in most schools. Or the observation that brain growth occurs in spurts suggests that intensive new experiences be scheduled for the periods during which brain growth spurts occur, and that activities such as skills practice or enlarging a base of experience by more study of familiar areas be timed for growth plateau periods.

Vastly exciting but still an embryo with respect to educational implications are explorations into brain chemistry. These suggest that there lie within the brain capacities to generate chemicals which can be used to improve concentration and memory or to change behavior--discoveries certainly worth watching.[3]

For the student of learning theory and television, there are parallels between recent brain research and more familiar cognitive studies. For instance, one can be found in the writings of Jerome Bruner, eminent expert in psychological studies of the development and functioning of the intellect, and a scholar who has also been directly concerned with the design of curriculum and instruction. In 1966, he remarked:

> There are three kinds of representational processes that are operative during the growth of human intellect and whose interaction is central to growth....They are...*enactive* representation, *iconic* representation, and *symbolic* representation--knowing through doing it, through a picture or image of it, and through some such symbolic means as language.[4]

And again,

> Growth involves not a series of stages, but rather a successive mastering of three forms of representation along with their partial translation each into the others.[5]

In 1977, Wilbur Schramm, Distinguished Researcher for the Communication Institute at the East-West Center in Honolulu, arrived at some similar observations in discussing developing media theory:

> Information can be received from different kinds of experience--participation, observation, and exposure to teaching directly or through media--but it has to be processed, interpreted, stored, and retrieved in the form of symbol systems or codes. There are three general types of codes, to which we give names borrowed from the theory of signs and from computers: *digital* (of which the chief examples are words and numbers), *iconic* (television, film, still pictures), and *analogue* (music and sound). The media are not pure examples of different codes, but different ones emphasize different codes. Print is almost wholly digital; radio is a combination of digital (words) and analogue (music and the sound components of speech); television and sound film can make use of all three codes, but their chief distinctiveness is their ability to present iconic information....
>
> ...Digital information is apparently processed largely in the left hemisphere of the brain, iconic and analogue information in the right hemisphere. If we understood this process fully, we would understand more than we do about learning from the media.[6]

The reader will note that there is not a one-to-one correspondence between these studies of the brain, of cognitive growth and development, and of media theory. But despite differences in vocabulary and viewpoint, there is enough congruity to keep the designer and the user of telecommunications on the alert.

The designer and user of telecommunications programs need be on the alert also for the strengths and weaknesses of technology as a promoter of teaching-learning processes. Already noted is its distinctiveness with respect to the presentation of iconic material. As such it can and should help balance the current school emphasis on symbolic learning.

Telecommunications obviously can bring to the student immediate events and content in all subjects not available to the teacher, no matter how talented. It can and does catch and hold the attention of the viewer, particularly when related to student interest and ability. It can, if linked to general strategies like change of pace, use of short segments, and action rather than talk, encourage motivation and command participation on the part of the learner. It can help the teacher put diagnostic and prescriptive techniques into practice for individual students because it gives the teacher time for observation of the individual and, in the case of the computer, provides feedback on individual student progress. It can provide role models with whom students can identify.

The Agency for Instructional Television (AIT) notes also that television can:

- relate instruction to children's experience or introduce experience not yet familiar to children.
- use presentation techniques not otherwise available to the classroom to show relationships, perspective, and dimensions. It can match, compare, order, and change order, transform, and transfer.
- provide problem readers with another opportunity to learn.
- dramatize the importance and usefulness of what is being taught.
- set up intriguing application opportunities.
- convincingly relate to different subject areas.[7]

Wilbur Schramm reinforces AIT's list and focuses on the concreteness of the medium. In this connection he notes that television can:

- provide a concrete and meaningful context against which to learn names, definition, other verbal knowledge.
- provide concrete reminders of the components of intellectual skills.
- provide concrete illustrations of the kinetic routines involved in motor skills.
- provide concrete illustrations of how cognitive strategies can be applied to new problems and new situations.
- provide concrete examples of situations of choice that put flesh and blood on the abstractness of values and attitudes.[8]

The fact that telecommunications has so many powerful capacities for teaching-learning does not mean it should be developed and used without discrimination. Producers and users need to become more sophisticated about the place of this powerful tool in education--more knowledgeable about what it can and cannot do in the classroom, in the home, in libraries, in community centers. Common sense, for example, tells us that, like the book, it cannot provide the direct experience which all of us need as a base on which to build iconic and symbolic learning. It does not do as well in presenting materials which require logical and analytical thought, as does the printed word. (Full understanding of the computer's capabilities in this respect are provocative, but not yet fully tested for educational purposes.) Although interactive technologies are now possible and growing in this capacity, the bulk of television still leans heavily on a relatively passive learner. And certainly telecommunications, by their very mechanical nature, cannot substitute for real human contact.

These caveats do not diminish the power of telecommunications. But they do call for more research on its unintended and indirect effects on the educative process. They underline the need for caution in using unproven generalizations about relations between learning and personality theory, media theory and teaching practice, and about the differences between learning from the linear, digital, symbolic patterns of print and the spoken word, and the simultaneous iconic observation patterns of the visual media. As Schramm pointed out in 1977, we have only the most primitive idea about these differences. There seems to be little reason to change that observation today.

Teachers and Teaching

- Recent research has documented that teachers can make a difference in student learning and achievement.
- There is an apparent antipathy toward technology by teachers.
- Teachers are more likely to use technology over which they believe they have control and to which they have easy access.
- Teachers usually will not take the time to prepare support materials to accompany instructional television.
- Teachers have a waning interest in film.
- Teachers are increasingly aware of production values.
- User involvement in adoption, monitoring and evaluation is correlated with successful implementation.
- Although scheduling has been a persistent issue, teachers continue to report that the ITV offerings are not convenient in terms of school and classroom rhythms.

Often teachers spend their work-lives in a tangle of complicated relationships. On the one hand, teachers are visible to students and, in some instances, to parents, but are not on public view to one another. They are accountable to policy level decision makers, but are most often monitored by institutional level persons. They are expected to be responsive to their students, but must recognize that this responsiveness can take many forms--cognitive, emotional, social, inter-personal. Further, they know that their behaviors and the outcomes of those behaviors are not universally agreed upon. Added to this complex of confounding elements is the growing call for teacher accountability; no matter that the "Accountability for what?" question is far from answered. Certainly, the teacher is important, but perhaps the shift from being important to being considered almost solely responsible is a less-than-favorable state for teachers.

Teachers are under fire. The complaints come from the public, from students in their classrooms and, in increasing numbers of instances, from their colleagues in the schooling ranks. The paradox, of course, is the awkward ideological relationship between being considered almost all-important in terms of providing instruction and the lack of status which surrounds that role. The times are difficult ones for teachers.

While the foregoing suggests a dismal picture, there is a growing body of evidence to support the statement that teachers' behaviors can be linked to positive pupil outcomes. One commissioned paper (Ward) notes that research has shown certain teacher-controlled variables to be consistently related to higher-than-predicted cognitive gains on the part of students. The teachers' use of time, the amount of active teaching, the careful orchestration of the classroom to increase so-called academic learning time, the teachers' organization and management of classroom activities--these and other teacher-controlled acts have been shown to affect how students learn in classrooms.

The teacher's role in the use of telecommunications is no less important than in his or her role in other aspects of creating a productive learning environment. Again and again, particularly during the Analysis Panel meeting, panelists spoke of the multiple demands made upon teachers. As the status, function, and role of the school is more uncertain in our society than ever before, so is the status, function, and role of teachers uncertain. Nevertheless, it remains that the teacher be the mediator between the student and the telecommunications media, even though, for many teachers, this adds another layer to their responsibilities.

Our sample of school persons was consistent in the reiteration of certain generalizations about teachers and technology. Some of the litany was familiar--access and availability of programming remains a critical issue--but some were fresh concerns--a possible antipathy toward technology on the part of teachers, for example.

Teachers believe they deserve to have control over media of instruction, but do not readily accept the notion of pedagogical and curricular control as well as the more typical mechanical control. The discussions suggested that the days of teacher-made materials to supplement and enrich instruction, a common feature for most who have been in and around schools for decades, is not any longer a piece of daily business. Also, it was surprising to note the apparent waning interest in films as instructional resources until that understanding was coupled with the growing sophistication of teachers regarding technical values of production (probably a consequence of home viewing of television).

In contrast to some of the puzzlements noted above was the constant admonition to innovators, in this instance to people concerned about the use of telecommunications in classrooms, to involve teachers in all phases of planning, production, field-testing, installing, monitoring, and evaluating media products. It became clear that this meant involvement well beyond token participation on advisory boards whose members are often well-distanced from production crews and media specialists who really do the work, and it stemmed from two sets of related consequences. First, there is the widely-held belief that teachers, those closest to the heart of instruction, will be most helpful in providing advice about the nature of classrooms, the potential response of learners, the appropriateness of the product for existing (or imagined) curriculum, the "fit" with the school organization. Second, if the teachers who will use the product are involved early on, it results in greater subsequent implementation and has the added merit of increased credibility on the part of teachers who were not involved.

After extensive discussions with teachers and administrators, numerous observation of practice, topped by the animated dialogue of the analysis panel, it is evident that (1) the complexity of the teacher's role has seldom been acknowledged; (2) teachers can make significant differences in the lives of children; (3) teachers will use telecommunications to the degree that they believe it suits their classroom environments; (4) teachers will contribute to the development and implementation processes; and (5) teachers' contributions, in honest and real ways, will increase the use of telecommunications products and processes in classrooms.

Resources and Inter-Institutional Relationships

- There is an apparent lack of leadership in the marketing of telecommunications as an important educational tool.
- A lack of knowledge of existing telecommunication resources is a concern at every level of educational decision making.
- Resources for school instruction are not coordinated for greatest benefit.
- Allocation of educational resources is irrational and unsystematic.

- There appears to be insufficient linkage among components of the educational system of organizations (e.g., schools, libraries, youth organizations, instructional television production centers).

- There are common goals of instruction and learning among the traditional school persons and the telecommunications specialists.

- Instruction and learning are prime concerns of many agencies previously thought to be disparate.

- The climate for cooperative ventures may be receptive again, especially in promoting the use of instructional television/technology.

- Reallocation of telecommunication resources may assist the schools in crisis.

- Detailed evidence that instructional television, for example, can make a difference in providing otherwise unavailable quality programming for schools ought to be heralded far and wide.

The issue of both financial and material resources available for instructional purposes pervaded the interviews and the Analysis Panel discussions. This was true whether talking with educators or telecommunications specialists. Clearly, both groups of people perceive resources available for their work to be in short supply. It would be difficult to question these perceptions in view of the broader economic picture and the plight of educational programs across the nation.

In addition, there is (or seems to be) a dysfunctional relationship between and among institutional components and decision making levels of organizations.

Closely related to the understandings about schools as organizations are the conclusions to be drawn about institutions with like purposes and their relationships. It is axiomatic that the United States has become, to a large extent, a learning society. There are varying estimates about the numbers of people and the number of organizations devoted to providing learning opportunities. (The quality of these provisions is not under consideration.) Although the school, particularly public schools, are conventionally believed to be the primary purveyors of instructional programs, it is not difficult to find instruction taking place in many places outside the schoolhouse walls: libraries, boys' and girls' clubs, social service centers, geriatrics centers, commercial and industrial training programs, post-secondary recreational learning programs, and the like. The citizenry _is_ preoccupied with teaching and learning, although that preoccupation does not always fit the typical (or historical) mold.

Given the conclusion above, it is surprising to some to see the few (and tenuous) links which join programs of instruction. Although one would expect to see a banding together of organizations and persons with similar purposes--provision of learning environments--such is not the case. The division of the territory, the carving out of the constituencies, the multiplication of the efforts--all are rampant in the more broadly conceived educational community.

Some consequences naturally flow from this divisiveness: redundancy of programs, far-from-ideal cost-benefit ratios, overlapping of efforts, and so on. Contrasted with these consequences, though, is the more common phenomenon of lack of knowledge about what is happening somewhere "out there." At issue in this second part of the puzzle is the waste of resources, human and material, which can be attributed to it.

A major benefit which accrued to the management team during the course of this present effort was the bringing together of people with common goals but with individual specializations related to those goals. School people met with ITV producers and public television station managers. People from publishing met with school administrators. Higher education members met with private sector television specialists. All discovered more common ground and mutually reinforcing points of view than any one group had supposed.

It became clear as this project moved forward that there was more like-mindedness than disagreement among the people interviewed and consulted. When the goals of schooling were put together with the goals for telecommunications in schools, the gaps decreased even further. It is possible and desirable to promote the meeting of minds and hearts across and between specializations so that common interests and expectations can be discovered, acted upon, and met. And, not to be ignored, the duplication of efforts and waste in terms of fiscal and/or human expenditures, can be avoided. Time and again, in interviews and at the Panel meeting, people talked about largely unknown past accomplishments, reflected upon how ideas didn't get into practice, and relived near-successes and past frustrations.

These experiences identified again the importance of creating a means by which inter-institutional relationships can be strengthened for the purpose of promoting quality instruction in schools, and with the end-in-view also of including the revitalization of people and organizations concerned with that instruction.

Further it was clear that inter-institutional relationships which, under the best of circumstances, one would assume to be necessary to carry off a complex operation, are simply not present in any great force.

Again, the byproduct of this lack of cooperative relationships is an apparent effect upon available resources. This is true for schools and it is true for funding agencies, production centers, and distribution systems. It will not be surprising for anyone to read that concern abounds about the resource drain at a time when the schools are in crisis while, paradoxically, the technological capability for acting upon that crisis is greater than it has ever been before.

It would seem that three inter-related factors can be used to offer some tentative solutions to the resource issue. First, it is necessary that leadership (school, telecommunications, policy) be encouraged, fostered, and rewarded to such a degree that resources can once again be validly appropriated for telecommunications use in schools. This leadership is already in place in the broader educational (including ITV) system, but it must be given systematic reinforcement for it to bring about changed practices.

Second, a strong case must be made for the reallocation of existing resources. At this point in time, it seems clear that the "schools in crisis" theme could be the rallying cry for those who believe, and can show to be so, that ITV or other telecommunications systems can help to alleviate the crisis and calm certain of the fears of teachers and the public. This reallocation, however, can only be accomplished, it seems, by the provision of a data-based set of conclusions regarding the positive effects of telecommunications upon learning environments and the people in them.

Third, it is time to create again or to administer vitamins to networks whose primary goals revolve around the reconstruction of the positive dreams of television's capability to enhance school learning. Along with these goals it is necessary also to reconstruct the resource availability/accessibility system. All of these essentials are inextricably interwoven. To realize these goals requires a coming together, a close coupling of ideas and support systems, a kind of time-share, support-share, and reward-share relationship among all of the organizations and people involved.

The management team surely realizes the difficulty of this re-creational enterprise, but believes firmly that it is time to wrestle with the problem.

III. INTERPRETATION AND REFLECTIONS

As is evident from the material in the preceding section, the findings from the study cover a wide territory and include a great range of problems and possibilities concerned with technology/telecommunications in the schools. In this section we attempt to view this mosaic whole, rather than its disparate parts, taking a look at the context of schooling now, making a few modest predictions about what the future might hold, and speculating about the promises of telecommunications in education.

A Time of Troubles

The schools are in trouble. So is our society. These are hardly surprising statements, as almost any citizen can testify. What is not so well known is that the two phenomena are intimately related. Historical and cross cultural studies document the inference that schools generally mirror the values and life styles of the nations they serve. They are the institutions whose major task is to refine and pass on the culture to the young and the uninitiated. And so, just as the American nation seems to have lost some confidence in other important institutions like government, the family, the church, community life and the economic system, so has it lost confidence in the schools. By and large they follow rather than lead the societies which create them.

It was not only the Vietnam War and the violent upheavals it spawned that created this state of affairs, though we are still recovering from those upheavals. Its roots probably go back to the beginning of the century when we revolted against the complacency, romanticism, and outward prudery of the Victorian era and began to examine our institutions not as "givens" in our environment but as man-made creations, as imperfect and vulnerable as mankind itself.

Whatever the reasons for these trends, it seems fairly clear that the schools, in the not-too-distant past, were considered bulwarks of the American dream of social mobility. They were seen as the body to take care of society's social problems--racial inequities and intolerance, the poor, the handicapped, drastic changes in marriage and family patterns, women's rights, the sexual revolution....

These burdens, laid squarely on the schools in the Sixties and Seventies, drained off a great deal of institutional energy--indeed, deflected much of it from their traditional educational task of sharpening minds and sharing the cultural heritage with oncoming generations. This period, in fact, created a confusion, which still exists, about what schools are for and what they can and should do.

Thus, as our society is fragmented, so are the central goals for the schools. And, as our national, state, and local governments are torn apart by single issue pressure groups and lobbies, so also are school administrators and governing bodies. Seldom is it possible to see the woods for the trees--to find governing boards concerned with the general educational welfare of their institutions rather than responding to political noise in the system. The constituents appear suspicious of authority, and those who are in responsible positions seem nervous about asserting authority. At the same time, the wheels of social and technological change run faster and faster.

Meanwhile, the teaching profession has been plagued by the baby bust in population and by the exodus of able women to more lucrative and prestigious occupations. Able teachers are locked by tradition and frequently by their unions into movement up the ladder by seniority only and are pushed by often questionable state requirements into using valuable time taking prescribed courses for certification and/or for moving to the next step on the pay scale. Academically talented young people seldom find reasons to make a financial sacrifice for a little respected profession.

Sadly, these trends appear at a time in our history when the nation and the economy have increasing need for a highly educated citizenry. Recent neglect of instruction in science and mathematics, aided and abetted by withdrawal of federal support, is extremely shortsighted to say the least, but, happily, there is the beginning of official concern about this situation. The nation requires not only people schooled in science and mathematics to man our growing hi-tech industrial, commercial, communication, information, and defense establishments; but we need also wise leadership in politics, education, community building, social welfare, and the arts where what is essential is depth, vision, sensitivity in human relations, concern for humanity, and compassion.

An Uncertain Future

Our schools face an uncertain future. Though there is no question of an immediate collapse (and thus we must prepare to deal with the schools as they are for some time to come), how this nation will educate its children and youth in the long run remains to be seen. The thinking citizen with concern about education begins to ask:

- Will the schools, both public and private, need to serve more and more in loco parentis, assuming the nurturing and custodial functions of the family? In that case, who will assume responsibility for the traditional intellectual functions of the school?

- Will the public schools gradually become schools for the poor, handicapped, the disadvantaged ethnic minorities while more affluent citizens pay for the education of their children at private and parochial schools?

- What are the chances of upgrading the position of teacher in terms of academic aptitude, public respect, and reward for competence?

- How can knowledge about effective teaching be better disseminated and practiced by prospective teachers and those already on the job?

- How can growing knowledge about effective schools be used to improve the quality of life and instruction in more schools?

- Can the recent discouragement and disillusion with both the schools and our society serve to wake up the population to the real educational needs of the nation?

- Are there ways in which telecommunications may be turned from a primarily commercial enterprise into one with responsibility and accountability for education for the schools and the homes of the nation? What could and should be the function of national agencies in such an effort?

Instructional TV--that product directed solely at the schools--also faces a critical time in the immediate future. Public television could decrease the amount of satellite transmission time it is designating for in-school programming and may concentrate more heavily on providing general audience programming. Such a circumstance could be the result of several factors:

- The development and production of quality instructional television is expensive in money and in expertise--more than can be managed by most local public television stations.

- The roles of national, regional, state, and local public television stations are undergoing change.

- As new technologies appear--like school-owned satellite dishes, cable television and home computers--there is concern that they will supersede the local public television station as a delivery system.

- The cutback in Federal allotments to CPB has forced cuts in the Community Service Grants that the Corporation can make to local stations.
- As funding for schools and for all public television development and broadcasting diminishes, the schools are less able to support their share of air time. School programs take up to 30% of available time. Their financial support amounts to 15% of the total station income.
- Some station managers feel that school services are more complex and demand more station resources than the use of the service justifies.
- There is confusion about the use level of ITV and the quality of that use in the schools
- Communication about available programs seems to be ineffective in reaching potential users.
- Technical equipment in schools is often out-of-date and there is little or no money for replacement.
- Many teachers continue to be uncomfortable about the mechanics of using ITV and to worry about the impersonality of TV as an instructional instrument.
- ITV has been curiously isolated, not only from the regular instructional systems in schools, but also from commercial TV and from public television for general audiences.

And so, the future looks cloudy. A litany of woes seems to plague both the schools and ITV.

The Promise and Paradox of Telecommunications for Education

Strangely, as the complaints about the weakness of ITV have grown, television itself becomes a more and more pervading influence in our culture. We are not talking only about the political image makers who appear periodically as the potent forces behind major political figures. Even teachers and parents, who some years ago dismissed television as the carrier of cartoons, soap opera, and violent sexy films, concede that it is possible for television to carry a serious message--that it can teach something worthwhile, albeit more to adults than to children.

True, television is basically a commercial, not an educational enterprise. True, its "boards of education" are essentially the advertisers and salesmen of our materially-oriented society. They are not held accountable for the educational quality of their products, yet their products are recognized as the most powerful educational influence in the nation. There is no question that television is the most used baby sitter in the country, and that it has in many ways taken over areas of life which were earlier considered to be solely the province of the family, of the schools, and more recently, of the political system.

It is not necessary, however, for this powerful instrument to be dedicated to the mediocre, to the sensational, and to the violent message. It is possible to lead rather than to follow the dictates of every poll that takes the pulse of the nation. It is possible to raise standards of taste in both form and substance, rather than being content with the least common denominator. This possibility presupposes that the public begins to demand an educational and cultural product from commercial television, rather than the pap which dominates much of the usual programming.

Everyone knows that the quality of productions on TV can be intellectually informative, aesthetically moving, socially challenging and morally uplifting. Such quality is not limited only to the offerings on public television, although we are told that 60% of U.S. households now look at PBS programs from time to time. Even with relatively sparse funds, ITV efforts can produce programs which are provocative, imaginative, and educative, given the kinds of people and material support which is routine for commercial products. And surely, commercial stations can do almost anything they would like to do, given an incentive and a demand for quality.

It is time the leadership of the nation wakes up to the need to link this extraordinarily powerful instrument to civic responsibility for the quality of American cultural and educational life. This is a task not only for concerned parents worried about the effect of violence on their children, although their concerns and efforts are not to be denigrated, but for all of us. The fact that the general public is relatively indifferent to the impact of commercial TV upon itself and upon the oncoming generation is little short of a scandal. We, the public, keep beating our breasts over the state of the public schools, but are unwilling to focus our attention on what could be done to harness telecommunications for the public good--to use it to raise our educational standards and our life styles.

As Robert Hutchins pointed out over ten years ago:

> ...the use of television...can be put in its proper light by supposing that Guttenberg's great innovation had been directed almost entirely to the publication of comic books....Television, together with other cultural forces aligned with it, is enormously powerful in comparison with anything the educational system can offer...[9]

If Hutchins is right, and we think he is, what can be done to change a negative into a positive force for good education in our nation? Why has instructional television not reached its educational potential? Where are the holes in the system? These questions need some answers before those who care about the education of children and youth can get to work on ways to improve the situation.

One important answer is that schools and school systems are more complicated institutions than was understood fifteen or twenty years ago. Experts then felt that enthusiasm, goodwill, money, well-developed curriculum, and able teachers could take care of existing weaknesses within the system. Most educators have since learned something from the fallout of the Curriculum Reform Movement and from the often bitter experiences of the Great Society. It is now known that schools and school systems have a life of their own which needs study and understanding if changes in the status quo are desired. Several of the papers commissioned by Designs for Education for this study speak to the specifics of this growing sophistication, as well as to improved knowledge and technique about curriculum development and the art of teaching.

Today those interested in educational change must learn as much as they can about those ingredients that make a successful teacher or a successful school. For instance, simply helping a teacher learn new techniques (like organizing a classroom for television use) is not enough to create basic change. It is a necessary but not sufficient condition for change in the school. The focus must be on the school as a unit and on the principal as a key factor in helping positive change to occur. That kind of focus can not only assist the individual teacher, it can result in institutional change.

Such new insights into the school as an institution and into the nature of educational change point up the need for a systems approach to the whole enterprise. Indeed, only as a "critical mass" of factors can be brought to bear on a given target can effective change be generated and sustained over time. Thus, despite the importance of the single school as a focus of operations, the school--the public school in particular--must first of all be seen in terms of the political and social context in which it exists; the hierarchical and bureaucratic school system in which it operates; the socio-economic and political community it serves; the mandates of the state and national governments; and yes, the general public attitude toward the schools mediated as it is by the press and telecommunications.

As of now, communication is poor between many pieces of the educational system. Furthermore, instructional TV seems to be operating off in a corner by itself. This seems to be true at all levels of the joint systems. There is not only public ignorance of the schools and their problems and what amounts to indifference about the effects of commercial TV, there is little connection between commercial telecommunications and education efforts, both formal and informal. What exists is spasmodic, superficial, and unsustained.

In addition, many schools and the teachers in them very often do not know what instructional TV programs exist, much less how to use them successfully in the classroom. Somehow or other, these programs are not considered a _regular_ part of instructional resources, nor are they always related to major curriculum needs.

The whole story is not nearly as gloomy as this recital might indicate. There _are_ teachers and schools who have done an extremely good job of using television programs creatively and imaginatively to carry or to enhance specific curriculums; whose equipment is up-to-date and accessible; whose faculty members are sophisticated in both technology and content; and whose parents and communities are enthusiastic supporters of educational telecommunications. There _are_ school systems, and regional and state networks who offer excellent technical assistance to schools with respect to telecommunications; who have organized resources and TV programs in such a way that they may be immediately related to ongoing curriculum and instruction; who see that the hardware is modern and in good working order; who help schools integrate new technologies like cable TV and the computer into everyday instruction; and who keep the public informed about what is going on in the schools about instructional television, and why.

So there is hope that the educational potential of telecommunications can be salvaged--even made part of standard classrooms. The trouble now is that these examples of excellence are isolated. There is little evidence of mechanisms or forums through which one group can learn from another or through which a good isolated effort can be spread to similar places.

Yet one of the surprising and delightful by-products of the meeting of Analysis Panel experts, made up of different types of roles within the school/telecommunication system, was their great pleasure in talking with one another and in learning what the system, even as it now exists, has to offer.

There are, however, few evidences that such opportunities occur with any regularity or that they are so organized that a "critical mass" is created which not only regenerates itself but also spreads knowledge about what TV can do. An informational effort a few years ago to acquaint schools and school systems with existing products and their use was well received but not sustained or institutionalized rapidly enough to make a significant difference.

In short, there is a crying need for an informational flow about communications design which touches all bases within the school/education/telecommunications system, is continuous, and pulls together knowledge about both systems in non-technical language.

A similar, but not so blatant problem exists with respect to curriculum. More good ITV material is available than most school people know about. These are, however, not organized so they can be immediately useful to teachers--that is, around the usual curriculum and instructional requirements of most school systems.

Organizing what exists, avoiding duplication, and finding the holes in standard curriculum TV offerings is more and more important in an era of scarce resources. Increasingly vital areas of the curriculum are tended by inadequately prepared teachers. Some poorer and more isolated communities in the not-too-distant-future may need to rely on telecommunications to carry large sections of their regular curriculums.

Perhaps by the time this report is reviewed, steps will have been taken by the Congress to shore up science and mathematics throughout the school systems. If not, this is one more big hole. And speaking of holes--there is little attention to foreign language, history, and the arts, including English and American literature. But before launching a full scale attempt to take care of these school needs, what exists should be matched against standard curriculums (K-12). Then it would be possible not only to fill up the holes but to provide over time a variety of approaches to similar curriculum objectives, so schools and teachers could have several choices within the same framework.

Another curriculum in need of attention is that of teacher education, both pre-service and in-service--not solely with respect to classroom telecommunications or to visual literacy or to the effect of technology on society, important as are these areas of study. Needed also are reviews of the latest research on such subjects as the nature of effective teaching and schools, together with models of what such people and institutions are like in real life. For it goes without saying that teachers teach as they are taught. And we know that the profession is losing both members and quality as a result of budget cuts and the fact that good teachers are taking other employment. Thus, staff development becomes even more imperative if we are not to lose a generation or two of children to bland mediocrity. This need goes for principals, supervisors, and superintendents as well as for teachers.

As far as technology is concerned, schools desperately need disinterested professional advice about what hardware to buy. Salesmen and the public get on bandwagons and try to interest school systems in hardware which is quickly obsolete or which does not match their previous investments. The computer industry is at work at this right now--a marketing invasion which could leave the schools with hardware they don't know how to use or for which there are very few course materials of any quality beyond the drill and practice which have characterized computer-assisted instruction for the past fifteen years. This is not to say that there is not an educational future for computers, but schools have been burned before and may tend to be cautious about spending big portions of decreasing budgets on this kind of equipment. As one computer-oriented salesman said, "There have been too many wagons over the cliff."

The experts interviewed, though impressed and interested in the potential of the computer, feel that real support for the schools in the near future lies in video tapes organized around curriculums. They have already replaced films in many school system media centers. Catalogs of available video tapes could and should include programs for general as well as school audiences and selected commercial materials. Video tapes, the experts point out, can be helpful whether the delivery system turns out to be public broadcasting stations, satellites beaming directly to schools, cable TV, or computers. Production energies, therefore, should continue to go toward the development of good educational programs together with appropriate ancillary materials for both students and teachers.

At the same time, keeping up with developing hardware and the compatibility of one generation or one system with another requires technical knowledge. The schools need this information not only for budgetary reasons but also because many of the new delivery systems can answer teacher problems about scheduling. Some can also help with difficulties relating to easy access for teachers. They can be "user friendly," words learned from people with technical backgrounds. The hole which currently exists with respect to this kind of technical knowledge is that it has not been translated into plain English for the use of school principals and local and state superintendents, who worry about budgets for hardware. This help could provide a vital service to schools and other educational agencies. Perhaps some thought should be given to reducing the number of production agencies to a few strong ITV organizations, independent producers, and to such commercial producers as could be persuaded that they too have a stake and a responsibility for education.

Movements of this sort require especially able leadership at all levels but particularly at the national level--leaders who can educate and persuade their peers. In this connection, it should be remembered that telecommunications are mass media and that quality productions require resources not generally available to local schools and stations even in the best of times. Certainly these resources are not available now nor will they be in the near future. Thus, it seems that national leadership is a necessary element in the development of new approaches and new funding and a new level of support.

National leadership is also required to link together the disparate agencies which make up an educational telecommunications system and to serve as a model for regional, state, and local agencies. This means creating occasions and mechanisms for organizations like the Corporation for Public Broadcasting, the Public Broadcasting Service, commercial producers, and computer technology companies to get together for purposes of sharing concerns, problems, and information about new developments. Such a linkage should also include educational leaders from the public schools, from independent and parochial schools, from commerce, industry, and the defense establishment, and from selected less formal educational enterprises like the YMCA and community centers of all kinds. All these groups are or should be interested in harnessing telecommunications for educational purposes. All should be aware of the need to educate the various "publics," not just parents and teachers.

And leadership is needed to monitor any such system once it is established. Monitoring, in this instance, does not mean supervision or control of operations. It does, however, mean keeping track of what is going on within the communication linkages and making that information available to the members of the system. Indeed, it could provide formative evaluation for the system itself so self-corrective steps could be taken if and when they are needed.

Is there any reason why the field of educational telecommunications should not be among the first to step into the leadership breach?

NOTES

1. George Comstock, "The Second Teacher: Recent Research on Television," The National Elementary Principal, January/February, 1977, p.16.
2. Neil Postman, "Engaging Students in the Great Conversation," Phi Delta Kappan, January, 1983, p.311.
3. Judith Brody Saks, "Latest Brain Research Offers Lessons in Learning," The Executive Educator, October, 1979, pp.26-28.
4. Jerome Bruner, Beyond the Information Given (New York, W. W. Norton and Co., 1973). pp. 316-317.
5. Ibid.
6. Wilbur Schramm, "Some Notes on Research, Theory, and Production in Instructional Television." Background Paper for The Essential Learning Skills Project, Agency for Instructional Television, Bloomington, Indiana. 1977. pp.10-11.
7. The Essential Skills Television Project. A Working Document, Agency for Instructional Television, Bloomington, Indiana, November, 1975. p.6.
8. Wilbur Schramm, op. cit. p. 14.
9. Robert Maynard Hutchins, The Learning Society. (New York, Mentor Books, 1968). pp. 142.

APPENDIX A

Summaries of Selected Background and Position Papers

In order to understand as fully as possible the influences that affect instructional television/technology and the factors that should be considered in its use in the schools, the management team commissioned six background papers in the areas they believed were the most pertinent. These subjects, identified as having some direction and logical relation to planning, production, and use of instructional television/technology, were: The School and Society; The School as an Institution; Curriculum; Teachers and Teaching; Schools and Technology; and Technology and Learning. A limited number of copies of the papers are available upon request from Designs for Education (DFE), Concord, Massachusetts 01742.

The paper on School and Society was delivered as a speech opening the meeting of the Analysis Panel; it is reprinted here in its entirety. The piece has been edited slightly but the flavor of the speech remains. Summaries, written by DFE Staff, of selected papers are also included here. These were shared with the Analysis Panel.

I. The School In Society, by Elizabeth C. Wilson

For starters, let me introduce you to my map of the territory with which we will be dealing. It will not be a detailed map because there are so many large pieces that we have time to touch on each only lightly. I do, however, want to spend a little time on the history of the idea of the relation between schools and the society they serve -- an old fashioned methodology, I know, but one to which I am much devoted.

Then there is the cross-cultural approach, which adds a horizontal perspective to the longitudinal one we can derive from the study of history. We make a brief bow in this direction. There follows some description of the present state of our schools and a glancing look at the relation of technology and the schools, together with the dismal recent history about the school's response to innovations of various kinds.

This recital leads to two hunches about possible movement ahead with respect to educational telecommunications and to a sampling of opinion about the value of TV as an educational tool. And, finally, we end with a series of questions about the future. Maybe you can find some answers to these questions in your deliberations.

But to get on with the task . . . .

As I look back at the long career I have had in education and observe the pendulum swings of opinion and attitude on the part of the American public vis-a-vis the schools, I would like to say with Mrs. Pettibone, that heroine of the thirties, "My dear, I have done this so many times!" And perhaps as a consequence of my advanced age, I should, like Rudyard Kipling, begin my story in those high and far off times when my view of education was new.

In those days, oh best beloved, there were two myths about American schools and society. They were not only part of the conventional wisdom of the times; they were also being pushed by some of our most prestigious schools of education. The first of these, handsomely articulated by George Counts of Teachers College, Columbia University, asked if the schools would dare to change society. This question implies obviously that the school had this power. The second myth was related to the first, namely, that the schools were above politics.

How we could have been so naive in those high and far off times is something of a mystery. It was, however, only fairly recently that we began to recognize how tightly enmeshed the schools are with the mood and ethos of given periods of history. In this instance it was the shadow and the afternoon of the Wilsonian era. During the early days of the century we had the Progressive Party on the political front and the birth of the progressive education movement at the same time. That was well underway when I met up with it in the thirties. This relationship is well documented by Lawrence Cremin's major work called Transformation of the Schools. In the days of Woodrow Wilson, the mood of the nation was optimistic--hopeful, confident, yet with a zeal for governmental reform and widespread social criticism. The great experiment of opening the high schools to all of the children of all of the people was just beginning. Why not then lean on the school as a basic instrument of social change?

The lesson in this for us is that the thinking about schools reflected the general social and political tenor of the nation. One could list many more examples of this kind of relationship. Suffice it to say here that there seems to have been an almost continuous tug of war in our history between those forces pushing a utopian and philanthropic system on the schools and those pressing for traditional intellectual endeavor -- between the Jacksonian political temper and that of Thomas Jefferson. Another mood that threads itself through our history in both school and society is anti-intellectualism, an idea beautifully documented by historian Richard Hofstadter.

In more recent times we have lived through the curriculum reform movement spawned as the aftermath of this country's shock over Sputnik -- a movement which never really got off the ground and into the schools. Why?? Not only because of inherent weaknesses in its understanding of the nature of schools as institutions, but more powerfully because it was superseded by the ideals of the Great Society as enunciated by Lyndon Baines

Johnson. Again, the schools were going to remake society -- to wipe out class and caste lines and to deal with the ever-present problem of poverty. You will be hearing more about the nature of schools as institutions later as we examine and talk about recent research on instruction, on the formal and informal contexts of schooling, and on curriculum.

Returning now to the present, I am sure we all realize that the pendulum has swung back to traditionalism with a vengeance -- almost back to the Hornbook. And again the schools reflect the mood of our politics and our society at present. The schools are in bad trouble -- so is society. The usual American self-confidence has been badly undermined not only in its schools, but also in other institutions like government at all levels, the family, the church, community life, and most particularly, the economy.

Then there is the whole confusing international front which does not respond to us in ways we think it should. The fragmentation of our society is mirrored in our uncertainty about what schools are for and about what they can and should do. The American dream is being shattered and, with it, the dream that more education can increase one's social mobility as well as one's pocketbook.

A litany of woes currently besets the schools. Here is an excerpt from a piece I did as part of a memorial to Ole Sand a couple of years ago.

The myth of local autonomy for school systems is underscored by the fact that they suffer from the same disease that infects governing bodies of all kinds and at all levels today. This disease, rampant since the era of the 60's, is called government by vocal militant constituencies -- i.e. pressure groups or lobbies. In other words, school systems, like other public bodies, are practically ungovernable. They are squeezed from top, from the bottom, and from all sides. They spend most of their time trying to appease militant constituencies, or making the internal arrangements needed to accommodate another new regulation or program mandated from above, such as health screening or new programs for the handicapped (to be managed without funding), or supervising the human rights issues being underlined by ethnic minorities and other underdeveloped populations like women or the poor. Very seldom do they find time to look closely at curriculum and instruction. Indeed, the school is fast becoming society's major agent for delivery of social welfare services as well as for picking up the pieces of the disintegration of the family as an institution.

Each of these laudable health and social welfare programs adds another task to those traditionally associated with the schools. And each requires its own set of specialists, supervisory staff, and compulsory reports at all levels. As a consequence, the governing body of the school is bogged down in paper work. Much of this gets passed down to the local schools. When teachers and principals complain about increasing numbers of reports and increasing amounts of time devoted to managerial and administrative duties rather than to teaching and to educational leadership, they are right. Three or four years ago, a bitter junior high principal counted 435 different communications received from his school system supervisors within the space of two months. The situation is undoubtedly worse now.

And so, instead of all systems within the school systems being "GO", all systems are clogged; not only with regulations and mandatory new programs, but also with political noises of many kinds. Since the brave new world of the 60's, when many special groups learned to shout loudly and to turn the political screws, governing bodies have been immobilized by the need to attend to and to mollify vocal pressure groups of one sort or another. They not only load down the system with static, but also they often infiltrate the system.

Quite frequently, for example, each school board member has a special interest group that is his or her particular concern and to whom he or she is politically indebted. Cagey staff members learn to play this game as well, resulting in either empire-building at the expense of the whole school system or stagnation of action because consensus cannot be reached within the school board. Hardly anyone really pays attention to the needs of the school system as a whole. The glue that once held the system together has become unstuck."[1]

To borrow a phrase from Ellen Goodman, we are faced with a "meltdown of trust" at all levels of operation.

A more recent lamentation was a two-part series in mid-October, 1981, by Jessica Tuchman Mathews in the Washington Post. Mathews not only deplores what has happened to the quality of American education, she spends a good deal of time comparing our efforts and emphases with those of the USSR, West Germany, and Japan, with special reference to our poor record in science and mathematics.

Mathews cites too much television as one factor in what she calls a "fearsome decline" in the quality of education. Among other factors are decline in the quality of teachers; the fact that able women who used to go into teaching now find other more lucrative occupations; chronic vacancies among math teachers, the best of whom have been seduced by the growing computer industry; the lack of public concern for the quality of education; lack of respect for teaching as a profession; lack of support systems to keep teachers up-to-date in their fields, and appallingly low pay. She notes that "morale in the schools is spiraling downward, and college graduates going into teaching consistently come from the bottom of their classes."

From an international viewpoint, Ms. Mathews feels that "The United States today stands alone among the industrialized nations in its indifference to the quality of education its children are getting."

I must say, I concur with Mathews' analysis and indictment of our society's neglect of the coming generation. It is enormously short-sighted. Her description of the schools' problems underlines the ways in which cross-cultural studies and comparisons can help us see ourselves in bolder outline than if we look only at our own present situation or compare it with our own history.

This is obviously no time for a course in comparative education, but we don't have to look very far to see how nations and communities consciously expect their schools to perpetuate their life styles and their political beliefs. Recall, for example, the educational system created by the ancient Chinese to support the mandarin bureaucracy which held that nation together for centuries. Or the "playing fields of England" and their use by Great Britain in its heyday, or the present day education systems of the USSR and Japan and the ways in which they serve the political ends of those nations. In short, schools and school systems, almost by definition, reflect the values of the societies they serve, either here or abroad. They cannot be divorced from politics at any level of governmental structure. They do not and cannot lead.

But what does all this have to do with instructional television/technology? Or with the criteria upon which funding and development of future programming should be based? Quite a lot, I believe. At least two hunches come to mind as I think about school, technology, and society. One grows out of a series of interviews I have been privileged to have with national leaders of education. It comes from the people who know most about educational technology; that is, film, TV, computers, video discs, video tapes, and the like, and their various delivery systems. Almost with one voice these technically oriented people say that new technologies will not get into the schools--that is, become institutionalized--until they are a consumer item for the public. They have to become popular products before the schools really adopt them. Thus it appears again that schools reflect the thrusts which characterize the community being served rather than the reverse.

The experts I talked with are sanguine about the computer _per se_, but not about the video disc. Reason: computers are already in homes and a great pitch is now being made to increase that home market. The video disc, on the other hand, although impressive and probably useful in schools, is more complicated than the average home consumer wants or needs. Two big companies are already phasing out their production of video discs since they are not selling on the home market. Again, the remark was made--schools seem to follow the home market rather than creating one of their own.

My wheels began to turn as I meditated on this kind of information and placed it against the school/society background we have just outlined. Then I added to this package the dismal history we have accumulated about school resistance to innovation. Indeed, I now wonder if we have been barking up the wrong tree.

The subject of innovation and the schools can be touched on here only lightly. We have, however, already mentioned the demise of the progressive education movement and the curriculum reform movement with its shining new sets of classroom organizational patterns to accompany new content and methodology. For example, team teaching or non-graded schools or individualized instruction with technological help as in the language lab, or small-group versus large-group instruction. And let's not forget the abortive efforts of the Ford Foundation to put TV in the schools in the late 50's and early 60's, and similar efforts in the mid-60's to launch computer-assisted instruction.

I tend to look with a jaundiced eye at the latest hoopla about computers. I am tired of school revolutions that do not come off. The story 15 years ago was that there was little software beyond drill and practice. The same seems to be true today. Perhaps when some substantive courses really are produced they should be aimed at the home instead of the school; that is, if we really want to get them through the classroom doors.

The second hunch I have about the interface of school, society and communication technology is that it underlines the fact that the school is but one of society's instruments for education -- for transmitting its culture and value system to the uninitiated. We may not be fully aware of this as a public, but communication technology in the form of commercial TV has joined the family, the church, and the school as a very potent educative arm of society -- for good or for ill. As a result, we all need to become much more conscious of what this technology, as a purveyor of education, can do and does to our young, and, indeed, to us grownups as well. Commercial TV certainly does point up some of our more mindless values as well as some of our most dangerous--the American penchant for violence, for example.

I suspect that one of the reasons we get so many contradictory and confusing messages about the educational value of TV is that the "school boards for commercial TV" are the producers and salesmen of our materialistic, dollar-oriented society -- that the major task of the broadcast stations is to sell goods, not information or entertainment. Furthermore, they are not required to state their goals and objectives or to be held accountable for their results in educational and cultural terms.

As a society, we have not yet come to grips with the difference between schooling and education. As for us educators, it may be that we have spent our time trying to shape TV for the schools rather than helping ourselves and the rest of the adult population understand that TV, as it now exists, has almost co-opted the functions of the family and of the school. It certainly has in terms of time-on-task, that requirement considered so important in the learning of traditional school subjects.

As to the noise in the system when it comes to the educational value of TV, it runs from one end of the spectrum to the other. Here are a few samples. At the negative end we have a devastating attack on TV by David Yellin, an assistant professor of curriculum and instruction at Oklahoma State University. This tirade was sent from Keith Mielke to Ginnie Biggy "without comment..."

Says Yellin as he concludes his article:

> "Suffice it to say that rather than being an educational instrument, television is potentially harmful to children's cognitive development. Language interaction, careful analysis of content, and objectivity are losing ground rapidly to the packaged entertainment of the TV screen. This is a major challenge to which the schools appear oblivious. Since the possibility of eliminating TV from the home is at best remote, the alternative is to eliminate television from the classroom, literally and figuratively..."[2]

Here is another example to get your blood heated up. Neil Postman is famous for his book called Teaching as a Subversive Activity, which is an all-out attack on the schools. This he later partially recanted in a fascinating article for the Phi Delta Kappan. We asked him to do a piece for this conference, and he responded with an essay from which the following quotations are excerpted. After he gets through some descriptive and imaginative material designed to shock, he makes the following statement:

> "...To what use can television technology be put to promote literacy?? Barring TV's use as a light source, bulletin board or bookcase as vividly described earlier in the article , the answer is plain. There is no way television can be so used. TV is the enemy of book culture, just as the printed book was and is the enemy of the oral tradition. ...TV's basic mode of discourse is the analogic, non-discursive image, made compelling by the fact that it is kept in constant motion. Television is thus an entirely different medium from writing, creating a different symbolic environment, requiring a different mode of response. ...Print is content-oriented, TV is form-oriented.
>
> ...The idea that many people are now trying to sell to various funding agencies is that TV entertainment and education can be made indistinguishable from one another. In one sense they are correct, since TV always teaches while it entertains. But it does not teach what they claim it teaches. It does not teach ideas or concepts or methods of analysis, and it cannot convey in an organized way academic content....For academic content is inseparable from the form in which it is codified; abstract, digital, sequential symbolism. A statement about the meaning of a play may be academic content. A play cannot be..."[3]

Having shot down TV as a substitute in any way for learning through reading and writing, this professor of communication at New York University notes that TV technology can be used "to assist students in making their visual perceptions keener and more discriminating." He thinks this kind of "instruction in the aesthetics of TV should be undertaken by art teachers, and almost always without the use of the TV sound system."

Postman does, however, give us a nice academic outline for a course or courses to help students understand the medium of television and the TV "culture" the medium creates...(without the use of TV, please).

About this, he states:

> "...As a general rule I would say that no TV set or film projector or record player should be turned on in the classroom unless the teacher intends to call attention to how the medium affects the audience. At all times (throughout the course) what we want to know is how a medium such as TV structures our time, and how it creates a concept of time; how it affects our social relations; in what ways it stimulates our senses; how it treats "ideas"; how it conveys attitudes about authority, community, personal identity, etc....."[4]

Then we have Dorothy and Jerome Singer, co-directors of the Yale University Family Television Research and Consultation Center, who are collaborating with Diana Zuckerman, director of the Macy Foundation Project at Radcliffe College. These researchers worry about the potentially serious consequences which may occur when the mind of a young child encounters TV. They believe, their research says, that children who have begun to watch television regularly are distracted from reading and show slower growth of reading and other kinds of intellectual capacities. After citing considerable research and the implications they see from this research, they, unlike our previous writers, end up by saying:

> "It may sound as if television is an enemy and that we are sounding a call to arms for the abolition of television.... Rather than abolish television, we should find ways of harnessing its tremendous power in the direction of more effective education for children. ...In effect, our position is that the television medium can be a great advantage for the growing child and a stimulant for imagination if material is presented in a format that is suitable for the child."[5]

A more sanguine view is expressed by Willard Wirtz, Secretary of Labor for John F. Kennedy, as he talks with Harold Shane about the National Assessment of Student Progress in the December, 1981 issue of Phi Delta Kappan:

> "...We all think too much in terms limited to the institutional aspects of education. I certainly agree that learning should be a life long process. I'm one of four generations of teachers, and I'm convinced that we've got to start thinking of the learning process as a whole instead of just what goes on in the schoolhouses....It will lead us to a fuller appreciation of the importance of adult learning. It will lead us to appreciate the fact that there's very little difference between the function of newspapers and other media and of the schools. The media, especially TV, continue to teach us when we're older; much of what we learn and believe comes from agencies that we do not assess effectively....The media have a great responsibility for educating and for education at all age levels. But I'm not sure that the media--with rare exceptions--recognize this as responsibility for producing careful, educational, significant materials."[6]

And finally, we find Michael B. Spring, acting director of the University External Studies Program at the University of Pittsburgh, believing that telecommunications will become the primary teaching device of a learning society. In a paper called "Telecommunications and the Learning Society", he argues that we, that is the USA, can become a learning society and that the birth of such a society will be spurred on by telecommunications and particularly by TV. Though he notes some of the negative aspects of TV learning as touched on in our earlier remarks, he bravely endorses the proposition of Robert Hutchins that:

> "(The learning society) would be one that...had succeeded in transforming its values in such a way that learning, fulfillment, becoming human, had become its aims and all its institutions were directed to this end."[7]

It is a lovely idea, but I am less optimistic than Mr. Spring. What forces are going to turn this nation from a worship of material goods in the form of commerce, industry, and consumerism toward one which really values learning? Certainly not the force of the school which we have seen to be almost always a follower rather than a leader. Can television/ technology do it? Not as it is now organized, according to Hutchins, who says:

> "...the U.S. will transform new opportunities for education into means for turning out producers and consumers...This has been the fate of television in the U.S. It could have been used for educational purposes, but not in a commercial culture. The use of television, as it was employed in the 1960's, can be put in its proper light by supposing that Gutenberg's great invention had been directed almost entirely to the publication of comic books. What could have been--and what one would naturally have supposed to have been--a great new instrument of enlightenment was largely devoted to selling soap, beer, deodorants, and cigarettes and to entertainment that would keep the viewer riveted to the set between advertisements....Television, together with other cultural forces aligned with it, is enormously powerful in comparison with anything the educational system can offer. We must, therefore, ask again how can cultural change be brought about?"[8]

There has been little change since Hutchins wrote over ten years ago. The schools are definitely in worse shape than they were at that time. The commercial broadcast systems continue to be more interested in buying and selling than in education. Indeed, they do not see their mission as education at all. Does the public care? There is little evidence that they do.

And so we are left with a good many unanswered questions like:

- Given the poor quality and the general malaise that pervades the schools today, will the public rally before it is too late?
- What are the possibilities of educating the adult population (including parents and teachers) at the same time as we educate the children? This is a variation on a theme of Margaret Mead who suggested that the young teach the old in the fast-moving world of today.
- Can the present discouragement and disillusionment with both the schools and our society as a whole serve to wake up the population to the real educational needs of the nation?
- In what ways can educational forces in the nation become more articulate about needs of children and youth and more politically astute?
- Are there ways in which aspects of telecommunications may be turned from a totally commercial enterprise into one with responsibility and accountability for education? Not only for the schools but also for the homes of the nation? What could and should be the function of the Corporation for Public Broadcasting in this effort?

To recap--we have considered here some old myths about the power of the schools in relation to society and about the school's insulation from power politics. We found that the schools reflect rather than create the culture which surrounds them. We mentioned briefly through cross-cultural references the intimate relationship between a nation's public schools and politics in general.

We examined the troubles the schools are now in and the difficulties they seem repeatedly to have with adopting innovations. We moved from this topic to instructional technology and television and came up with two hunches about possible movement ahead with respect to educational telecommunications.

The first hunch suggests that schools will move only as mass markets move and hints at the possibility of getting at the homes ourselves before we try to move the schools.

The second one is similar--that we educators must pay much more attention to commercial TV than we have done so far--that commercial TV is educating, whether we like what it is doing or not. It is the powerful education machine of today--not the schools, and certainly not the small inroads into the schools which have been made to date by instructional television.

Next we moved through sampling of opinion about the value and power of TV on the assumption that the range of opinion reflects the diversity which characterizes our society and our lack of knowledge about the effects of technology on society and the schools. More particularly, it reflects confusion about the difference between schooling and education. At one end of the spectrum we saw that TV is considered an educational evil of the first water. At the other end we found the possibility that telecommunications and the mass media can remake society's value systems.

We ended with a series of unanswered questions which we hope can be pertinent to the deliberations which will follow.

In closing, let us return to the Wilsonian era and the words of Woodrow himself. They reflect our current turmoil more than we might like to acknowledge. At Princeton University in 1896, he said:

The days of glad expansion are gone, our life grows tense and difficult; our resource for the future lies in careful thought, providence, and a wise economy; and the school must be of the nation.[9]

Footnotes

1. Elizabeth C. Wilson, "Closed Captive Bureaucracies," Education in the 80's: Curricular Challenges. Washington, DC, NEA, 1981, pp. 158-159.

2. David Yellin, Oklahoma Monthly, Vol. 7, No. 9, Sept. 1981, p. 72.

3. Postman, Neil. Unpublished paper. DFE. 1982.

4. Ibid.

5 Dorothy Singer, Jerome Singer, Diana Zuckerman, "What Every Parent Should Know About Television." American Film, January/February 1980, p.44

6. Harold G. Shane. "Measuring Educational Quality." An interview with Willard Wirtz, Phi Delta Kappan, December 1981. p.267.

7. Robert Maynard Hutchins, The Learning Society. (New York, Mentor Books, 1968). pp. 164-165.

8. Ibid. pp. 157-158.

9. Jacques Barzun, "The Tyranny of Idealism in Education." Education in the Nation's Service Series, Frederick W. Praeger in cooperation with the Woodrow Wilson Foundation. New York: 1960. p. 130.

II. The Formal and Informal Contexts of Schooling

by Ann Lieberman, Associate Professor
Teachers College, Columbia University

Lieberman suggests that systematic observation and disciplined inquiry over the past three decades have resulted in a clearer understanding of both the formal and informal contexts of schools. She attends to the norms and rewards for teaching, the organizational properties of schooling, the people in the process, leadership, resources, technical issues, and developmental concerns. She refers to the mix of these school variables as the "culture" of the schools and notes that an understanding of this culture (or these cultures) would contribute to making differences in schooling practices. At issue, then, is the degree to which the culture and an understanding of it facilitates or impedes the use of instructional television/technology.

Knowledge About the Organization of School -- The School Culture

- Schools are characterized by "regularities" which guide practice and which help or hinder innovation.
- The "regularities" (e.g., schedules, rhythms, daily activities) influence the teachers' (and others) work.
- Although the regularities can be formal, they are also informal in terms of the teachers' interpretations of them and of their power.
- Teaching is a complex activity demanding a high incidence of decision making--in advance of instruction and during instruction.

- The constancy of the necessity to engage in decision making cuts across levels of schooling, although the nature of the decisions may change.
- Teaching is most often experience-based in that teachers respond to the requirements of the setting (formal and informal) to create some degree of order for themselves and for their students.
- The experiences which are most powerful in bringing order to classroom life tend to be the ones which persist even in the face of potentially (intellectually-based) "better" ways of teaching.
- Despite the complexity of the teaching-learning setting, schools tend to work because there are many informally shared understandings that are, in effect, tacit agreements about practice.
- The principal is a key agent for change.
- The principal's role will depend, in large measure, upon the context of the school in which he/she serves.
- Principals, through their school activities, make subtle but powerful statements about the norms of the school.
- The elementary school principal appears to have more powerful effects upon the school culture than does the secondary school principal.
- Vague goals make priority-setting difficult.
- Teachers in schools are, more often than not, isolated from other adults. This results in lack of consistency of practice across classrooms and in a teacher reward system which depends primarily upon teacher-student interactions.
- Much of the above contributes to the climate of uncertainty which seems to pervade school groups--this uncertainty seems to contribute to the lack of tangible and real rewards for teachers and administrators.

Organizational Characteristics of School Improvement

- Introducing change into schools seems to work best when there is a combination of "top down" and "bottom up" strategies.

- It appears necessary to involve teachers systematically in any school improvement effort for it to result in widespread implementation.
- Feedback systems regarding the introduction of an innovation should be interactive and at least two-way in direction.
- The variance of teaching styles and strategies makes it necessary to involve teachers in innovative activities in personalized ways.
- Ideas that cannot be translated into practical, daily classroom activities will probably not take hold in the school culture.
- Innovations must be adaptabale to the norms of the school.
- Schools and teachers are often mandated to change without being provided with the necessary support systems to ease that change.
- Non-judgmental help in an informal mode appears to be positively related to school and teacher change.
- Change strategies which account for the developmental nature of change (from personal through management to consequences) appear to be most effective in promoting school and teacher change.
- It is dangerous to rely only on the technological aspects of a proposed change and to ignore the human resources necessary to support it.
- New ideas are most often introduced to schools from outside the schools, but their successful implementation depends on strong leadership within the schools.
- Informal teacher leadership is often the most powerful force for change in schools.
- Incentives for change must be built into any strategy for implementing change.

III. Curriculum and Education

by M. Frances Klein

Professor of Curriculum

University of Southern California

Klein argues that the curriculum which is practiced in schools is often different from the curriculum that is believed to be in place. She discusses curriculum decision making, the theories which do or do not guide that decision making, the dominance of a particular view of teaching and learning, and notes the lack of content and pedagogical balance across instructional settings. These descriptions of curricular practice suggest important considerations in terms of providing guidance for the production and use of instructional television/technology.

Lack of Consistency in Curriculum Decision Making

- Curriculum decisions are made at different levels in the school (and societal) systems.
- Decision levels include the ideal, the formal, the instructional, and the experiential.
- Formal decisions made at federal or state levels directly affect the curricula in schools.
- Decisions at the local district levels also affect curricula in classrooms.
- There is some evidence that the decisions at the two levels above are not consistent.
- The ultimate decision makers about the curriculum are teachers and students.
- The teacher makes significant decisions about the curriculum, which may or may not be consistent with those at the more formal levels of decision making.

- Ultimately, the student decides whether he/she will participate in the curriculum, notwithstanding the decisions made at other levels in the system(s).
- If a curriculum is to have maximum impact upon students, decisions made at the different levels should be consistent with each other.
- There is a lack of curriculum development at the local school level.
- There is a gap in communication regarding decisions made at the various levels.
- There have been few attempts to systematically view or guide the decision making at these levels.

Theoretical Underpinnings of Curriculum Practice

- It is believed appropriate for curriculum decisions to be guided by theory.
- The most dominant theoretical position in curriculum planning is behaviorism.
- Behaviorism takes the form of behavioral objectives, reinforcement techniques, distinguishing undesirable behaviors, and motivation of students.
- Although behaviorism tends to drive curriculum planning, it does not appear to be dominant in instructional practice.
- There is evidence that teachers do not consistently use any theoretical model of instruction.
- Although many teachers profess agreement with statements about humanism, there is little evidence that it guides their instructional practices.
- Teachers appear to find comfortable ways to interact with students and persist in that mode regardless of the goals of the curriculum.
- These statements tend to confirm the belief held by many curriculum specialists that curriculum practice lacks theoretical underpinnings to guide teachers as they make curricular decisions.

Predominance of One Curriculum Design

- The process of building curricula is limited in scope.
- Although most curriculum scholars advocate using a variety of designs in building curricula, it is apparent that one is used almost completely to the exclusion of others.
- The dominant process is one which emerges out of a conception of the subject matter to be considered by the curriculum.
- Other orientations are the society and its problems and the needs and expectations of the student--these are not observed in practice.
- The subject-matter-derived design tends to foster convergent thinking, sequential learning, logical organization of content for students, and standardization of the curriculum.
- The orientation immediately above is highly compatible with the behaviorist theory of teaching and learning.
- The use of the subject matter design accounts for the occurrence of other curriculum practices such as a limited array of goals and objectives (in curriculum plans *and* in practice), passive and sedentary activities of the traditional verbal type, an emphasis upon standardized testing, instruction of the total student group, and attention to time on task for students.

Range of Resources Used

- The range of curriculum resources is restricted.
- The text is the single most-used piece of instructional material.
- Teachers report that they use extensively their own background and experiences and student needs, interests, and abilities.
- It is widely observed that the textbook *is* the curriculum, and teachers feel obligated to "cover the text."
- Some use of audiovisual materials is observed in elementary classrooms, but this use drops dramatically at the secondary level.

- Instructional materials have been observed to focus upon low level cognitive functioning, most often at the recall level.
- Classroom life is also characterized by heavy reliance upon workbooks and commercially- or teacher-prepared worksheets.
- The materials noted here foster the behaviorist view of teaching and learning and foster sequential, convergent, and common learnings which can be objectively evaluated.

The Imbalanced Curriculum

- The curriculum offered to students is a narrow and restricted one.
- The current emphasis is upon "back to basics" and is limited in many (if not most) schools to reading and mathematics.
- This emphasis is not restricted to elementary schools but is also found in secondary school settings.
- Many traditional goals of the curriculum are being neglected (e.g., learning how to learn, appreciation of different cultures, etc.).
- Students may be being short-changed in their schooling by a narrow curriculum which does not adequately prepare them to live in a complex, changing society.
- A balanced curriculum means that certain already-in-place curriculum areas would be replaced by others. The consequences of such a trade-off must be made public and explicit.
- Curriculum practice as described above appears to persist in that attempts at curriculum change have not been marked by success.
- Curriculum specialists believe that decisions about the curriculum should be made consistently from a systematic framework so that decisions, practices, materials, and expected outcomes are not only consistent and compatible, but are also reflective of an understanding of the options available to curriculum planners and teachers and students.

IV. Technological Capability in Educational Settings

by George L. Hall, Director

Virginia Department of Telecommunications

Summary Statement: The author develops his paper on instructional telecommunications systems from an administrative point of view: the cost of teaching-learning when one of the three educational technologies is employed. These he identifies as Video (instructional television), Audio (instructional radio), and Lego (a micro-computer processor that permits the learner to choose video and/or audio instructional materials).

Detailed descriptions of the technologies which are, or could be, employed in each of these instructional systems are presented. The basic communication process components necessary for each are identified: the creation of an instructional message, delivery and storage of the message, reception and response to the message. Efficiency of each in terms of teacher labor, student labor and attitudinal responses of both are set forth, with the conclusion that a mixed system incorporating Video, Audio, and Lego will eventually result in more efficient, economical teaching and learning labor, thereby reducing costs of current educational modes.

Highlights of the paper follow.

Hypothesis: The ability to save human effort, to increase the efficiency of labor assigned a task, is a critical economic characteristic of all tools and technologies. Instructional television and technology, when applied to routine instructional work, rarely have been expected to yield this important and beneficial process effect on any sort of systematic basis. Instead, instructional television and technology have been expected to offer delivery convenience, sensory attraction, content variety and low use-unit costs. These characteristics are generally of a lesser economic order than systematic saving of labor. The current economy and other social pressures require an examination of education technologies in terms of their labor-saving potential.

Levels of Educational Application: The telecommunications technologies are clustered among three levels of application effects identified as linear passive, human transactional, and content interactive. Each is analyzed in terms of two kinds of labor commitment: teaching and learning. The reduction in the allotment of physical resources and the attitudinal effects in teachers and students are cited.

1. Linear Passive media systems (instructional television, radio and educational films) permit the display of predetermined successions of symbol element within a more-or-less fixed time frame. Linear Passive systems, while generally not expensive from the standpoint of unit-use by learners and teacher, have not contributed to any important labor saving economies in schools and colleges and are not likely to do so.

2. Human Transaction media systems (limited video and audio delivery systems) via Instructional Television Fixed Service (ITFS), closed circuit television (CCTV), cable television (CATV) and the telephone allow teacher(s) and learner(s) to communicate flexibly with each other during a real-time interval. The sequence of the instructional transaction depends upon the behavior of the parties participating. Human Transaction activities can stand alone as teleconferences or be combined with Linear Passive and/or Content Interactive modes.

This system can only serve several dozen learners at once in all receiving locations. This might reduce by one-to-three the number of teachers required. However, the overall labor-saving returns are not considerable, especially when the capital/operating costs are taken into account. To date, use has been sporadic so that the teaching labor force in a given institution shows little or no overall reduction. For learners, labor saving occurs largely in reduced travel-to-class time. In public school programs, human transaction systems have had little value to date.

3. Content Interactive media systems (large capacity computer systems, photo-mechanical teaching machines, microprocessors) make it necessary for learner(s) to respond actively to a contingently emerging symbol flow in such ways as to shape the exact sequence and pacing of the ensuing instructional activity. These systems can function for masses of

individual learners or for limited sized groups. It is the only media system of the three that can have testing and measurement procedures as an integral part of its function.

Historically, Content Interactive technologies were of two kinds: the large capacity or "mainframe" computer system and the photo-mechanical teaching machine. Mainframe computer instruction was psychometrically promising, but usually extremely expensive on a per-user count. Furthermore, learners often complained of the monotony. Such efforts were usually restricted to experimental programs, and labor-saving benefits of a major kind rarely occurred. The simpler photo-mechanical teaching machines were often difficult to service and maintain. Instructional programming was scarce. Labor saving benefits from their use were correspondingly scarce. However, these initial applications often pointed up the essential virtues of Content Interactive technologies: they permitted individual learning rates and paths; they had testing and measurement procedures built in (in both diagnostic and summative aspects); and they allowed learners to operate with substantially less direct attention from attending teachers.

Current Status of Content Interactive Systems: Today, versatile microprocessors can give branch-programming "intelligence" to a range of moderately sophisticated and psychologically appealing media systems and arrays, many of which are reasonably priced. Non-interactive, one-way systems are defined as simplex designs. The sender can select and control all data outflow. Interactive systems permit two-way communications and must have these essential components: input-output terminals, two-way communications links, (micro) processors and accessible storage banks. Communications links may be only a few millimeters or thousands of miles in distance, depending upon the physical separation of the system elements involved.

Two types of content interactive installations suitable for educational purposes are identified as discrete and systemic arrangements. The components of a discrete arrangement are a microprocessor, local storage banks of floppy discs or audio-cassettes, storage play-back banks of videocassettes and/or videodisc machines, a TV monitor with paired sound for output, and a keyboard console for input for each Learning Station. While each Learning Station is essentially technically independent, program material must be ordered from an outside source and manually delivered. The learner orders up instructional sight and sound materials and his/her responses determine the exact flow, sequence and pace of the "positively reinforcive" presentation. An electronic record of the learner's performance is automatically preserved for analysis by the teacher and the learner. The cost of a discrete Learning Station would probably be at the "under $10,000 level."

The systemic arrangement consists of a similar Learning Station, but with fewer different pieces of local gear because the station is linked into a large scale Master Control facility. The learner works directly from the keyboard console as in the discrete system, but the interactive instructional program comes from a distant Master Control. A single local systemic Learning Station may cost "under $3,000" but there must be a back-up system investment of some $1,000,000 or more for the Master Control element capable of serving thousands of connected terminals simultaneously, each to a different instructional unit.

In the short term, the discrete system will be most appealing to educators because of the limited investment demand. In the long term, the economic advantage will shift decidedly in favor of a large, "shared" systemic network with its lower unit cost and mass application potential through cable systems and common telephone lines.

Economic Efficiencies Projection: Content Interactive technologies, used systematically, can save teaching labor by freeing teachers to spend proportionately more time on individual students needs. Furthermore, by assigning a large percentage of students to self-administered instruction during the school day, a notably higher teacher/learner ratio will result. Gifted students can move ahead at a more rapid pace and can consume more curricular content than in traditional learning time frames.

This re-deployment of teacher/learner labor offers the potential for reducing labor costs. Even after taking into account the costs of Content Interactive technology and programming, savings could come to represent the cost of every fifth or sixth teacher in a roster. Such dramatic developments over the next decade would, for the first time, put educational technology into a critical utility position within our educational system.

General Observations about Systems Costs: As a guide for educational administrators contemplating purchase of instructional technology, the author cites tne following:

1. Comprehensive video and computer delivery and storage systems are apt to carry much higher initial and operating costs than audio systems alone.
2. Relay systems show tremendous cost variations, depending upon their complexity and the number of users.
3. Direct to user transmission delivery unit-costs are notably lower in mass broadcasting and CATV (closed circuit) forms.
4. Storage and distribution costs vary depending upon the system used.
5. Video production costs, capital out-lay and operational, are relatively high. Audio production costs are very low. Computer production costs are high, similar to video production.
6. Computer terminal costs are 2 (or more) to 1 more expensive than video terminals. The latter are more expensive than radio terminals by a similar ratio. Terminal costs are only a tiny fraction of the cost of the whole media system to which they may be attached.

7. The most important cost principle to recognize is that these media systems should always be evaluated by educators relative to the savings they should generate over time.

V. Recent Research on Instruction

by Beatrice A. Ward

Deputy Laboratory Director

Far West Laboratory for Educational Research and Development

Ward claims in her paper that the years since 1970 have included major advances in knowledge regarding what constitutes successful instruction in school classrooms. This adaption of her commissioned paper presents in summary form these findings. Given these findings, two critical questions for the DFE validation conference emerge: (1) to what degree do these findings truly reflect the body of research and/or practice? and (2) what implications do these findings have for the role of instructional television/technology in schools?

Background

- The findings are equally important when television is a self study as well as a classroom tool.
- At least for the near future, the school classroom will continue to be the primary instructional setting in this nation.
- In the complex world of classrooms, it is necessary to establish a mechanism for living and working together for five to six hours per school day.
- Because the features which appear below take different forms in different settings, it is necessary to focus on products and processes that will be adaptable to a variety of school and classroom structures.

Teacher Expectations

- Teachers who perceive their students as capable of learning the curriculum tend to have students with positive achievement scores and positive views of themselves as learners.
- Teacher acceptance of responsibility for student learning is an important factor in identifying successful schools.
- Teacher expectations help determine the level of effort and persistence that students exhibit.
- Teachers who view themselves as responsible for instruction and who expect all students to reach appropriate levels of growth in learning based on their teaching typically allocate more time for teaching and spend their time accordingly.

Active Teaching

- Active teaching is causally related to student learning as measured by traditional achievement tests.
- In active teaching, learning goals are set and articulated to students, student progress is actively assessed, and frequent class presentations illustrate how to do assigned work.
- Active teaching is characterized by teacher behaviors that help students know what they are supposed to be doing.
- There are frequent occasions of feedback to students about the accuracy of their work.
- There is careful and systematic monitoring to assure that the student is doing what he or she is supposed to be doing.
- There is frequent interaction with the teacher, especially in public lessons and recitations that are briskly paced and conducted at a difficulty level that allows consistent success.

Use of Time

- Time is a critical instructional variable.
- Teacher allocation of time and student use of time are especially significant in terms of the quality of that use.
- Academic Learning Time (ALT) is the amount of time given to a particular content area or instructional task. Within ALT, the amount of time the student is actually engaged in attending to/doing relevant learning tasks is considered. Also, the degree of accuracy with which the student completes the task is noted. The three issues are considered simultaneously. High ALT is that portion of the allocated time in which the student actively engages in learning tasks under conditions that assure high levels of success.
- Active teaching is related to high levels of ALT (see above).
- Active, interactive, and personalized use of time is related to learning.

Student Participation

- Integration of content and student interaction forms is related to student achievement.
- The successful student knows not only the content but also how to use that content in instructional settings.
- Levels of schooling (e.g., elementary, middle school, etc.) affect the ways in which students go about engaging in learning tasks.
- Student interaction with content varies across student groups.

Instructional Intent and Student Understanding of What Is To Be Learned

- It is assumed that, in order to be successful, students must understand and interpret both what is taught and what they are to do to demonstrate skill and knowledge acquisition.
- Students can describe the requirements of their assignments in terms of what is to be done.

- The manner in which instructional activities are set may influence the match between intent and student understanding.
- Students seem to have more difficulty describing the purpose of their assignments than the assignment itself.
- Learning tasks differ in terms of the probability and efficiency of task accomplishment, and these differences can be described as risk and ambiguity.
- Although teachers may purposefully assign tasks that involve high risk and ambiguity, students will attempt to negotiate less demanding work, find ways to get someone else to do the work, or circumvent the task.

Use of Language in Instruction

- Approximately 5 to 6 million school-age children and youth, in 1978, had mother tongues other than English and/or lived in households where languages other than English were spoken.
- The language used for instruction is a significant instructional feature.
- The capability of the teacher to clarify meanings and concepts and explain instructional tasks in English and the student's language appears to be essential to successful progress in learning for non- or limited-English speaking students.

APPENDIX B

Summary Report of Interviews Conducted for the Study During Late Winter and Spring, 1982

Two sets of interviews were conducted for the study. The first set, summarized below, was with representatives of both the users and producers of telecommunications for both public and non-public schools. The second set was with persons who represent national organizations and leadership in the fields of curriculum, instruction; these summaries may be found on page 17. The interview summaries differ in some ways--in style as well as content--in that the field work and reporting were done by two staff members and the material reflects their individual styles.

In the first set of interviews, the intent was to sample the opinions of representatives from all levels of the Tyler-Goodlad layered scheme of curricular decision making--ideological, societal, institutional, and instructional. The management team designed a strategy for sampling each of those levels through 31 interviews in four states (primarily by telephone) with teachers, principals, curriculum directors, superintendents, chief state school officers, librarian/media specialists, instructional television (ITV) producers and directors of local, regional, and statewide instructional television/technology agencies.

Representatives of professional associations and instructional television agencies whose decisions and actions impact on the curriculum were also interviewed.

Before summarizing the interviews, a brief description of the organizational patterns in each of these four states for providing instructional television services to public schools might be useful. Each state was chosen as representative of the distinctly different organizational patterns in use for instructional television:

California is a large state with many different and independent television operations, some tied to public television stations, some to public school districts, and others tangentially to the State Department of Education.

New Hampshire is a small state; there is close involvement of some school districts with the instructional television service, and there is limited state support.

South Carolina is an experienced, state-controlled system with daily offerings of television programming in every subject for every grade level. These offerings are accompanied by teacher guides and schedules, and not only teachers but librarians and other school service personnel use the system widely.

Wisconsin is a state-managed system with considerable experience in producing and delivering television programming to schools; it has a substantial number of users.

To return to the interview summary: There is a close correlation among responses given by educators and by those providing ITV services. Indeed, at least 17 of the 19 ITV professionals interviewed began their careers as educators.

Because these were structured interviews, the responses are grouped under the questions posed. Any marked difference under each question is noted. In addition, information pertinent to the study, but not falling within the confines of the questions asked, is noted.

1. What curriculum emphases are currently in place?

There was unanimous agreement that the basic skills in language arts, reading and computation are consuming the greater part of the school day. Receiving less attention, in descending order, are science, social studies, music, and art. This appears to be true at all grade levels.

2. What do you believe the curriculum emphases will be in 3-5 years in your setting? Why do you think so?

The majority felt that emphasis will continue to be placed on the basic skills. One-third of those providing ITV services felt that school budgets are too erratic to predict that far ahead and that emphasis will be influenced by the money available and by whatever the current educational fad will be.

In specific subject areas, interviewees mentioned computer literacy skills most frequently, followed by vocational/career education and science. Math, social studies, music, art, and survival skills, including economics, received equal mention as being of third importance. Remedial instruction in the basics for secondary students was voiced by high school teachers. English as a second language is becoming an increasing instructional need.

3. What do you think causes teachers to decide to use instructional television/technology as a tool of instruction?

Most respondents gave more than one answer. Frequency of each is noted as follows:

a. Meets a teacher's need: 12
b. Enriches classroom teacher's instruction: 1
c. Working equipment easily accessible: 8
d. Any quality program, regardless of subject area: 5
e. Non-duplication of classroom activities: 6
f. Provides greater economy of teacher's time: 3
g. Positive support from principal and parents: 2
h. Keeps both teachers and students up-to-date: 2
i. Offers students another model, a change of pace, current relevancies; students want to watch TV; students "learn better seeing;" is a "time-filler" for teachers; is superior to film: 1 mention each.

4. What do you think prevents teachers from making such a choice?

Preventing factors are the reverse of the above, with the lack of equipment and accessibility mentioned most often. Additional prohibiting factors cited were:

a. Lack of utilization skills: 8
b. Pressure of other duties and lack of time: 6
c. Schedule difficulties: 4
d. Fear of implied incompetence: 4
e. Less competent, non-creative teachers threatened by ITV: 4
f. Quality programming in specific content areas unavailable: 4
g. "Talking heads" turn off students: 3
h. Content and/or production elements outdated: 3
i. Hard to start something new; parental disapproval; not integrated with curriculum; presentation of content not relevant to students; fear that colleagues will assume teacher is "goofing off": 1 mention each.

5. If teachers do select instructional television/technology to use as part of the instructional program for which they are responsible, are there preferred lengths of programs, lengths of series, subject approaches, ancillary materials?

Preferred length of programs: There was unanimous agreement that programs designed for primary grades must be 15 minutes; intermediate grades 15-20 minutes. Scheduling difficulties with 20-minute programs was often mentioned by ITV services professionals. For secondary students, any length is acceptable if the program is available on videotape and has unlimited rights. However, 30-minute programs are the most easily utilized. Caution was expressed frequently about the lack of use of programs under 15 minutes in length. Ready access to videotape recorder (VTR) playback machines may make 10-minute programs acceptable.

Preferred length of series: The general consensus was that primary and intermediate teachers prefer 30-32 lesson series, one per week, with a second choice of 13-15 lesson series, one per week. Secondary teachers with VTR's can use quality series of any length providing they have unlimited rights, but short series of 6-12 lessons appear to be preferred. It depends, of course, upon the subject matter. High school teachers also would like rights to programs of 60 minutes or longer duration--one time only specials--to be used at the appropriate time in their classrooms.

Preferred subject matter: High school teachers mentioned their own area of specialization. Primary and intermediate teachers mentioned all areas. Consensus was that no matter what the subject, programs must be of high quality before the secondary teacher will use it. This was true of many lower grade teacher comments, as well. Teachers are aware of poor technical quality and are using fewer films because they are scratched and dated. Teachers and students want up-to-date content and production elements.

Ancillary materials: Considered to be an absolute must, ancillary materials should be concise and well written, but not overly elaborate or lengthy. Identification of rights with each series is helpful. An indication of how each program helps to meet mandated curriculum appears to motivate use of ITV. There was some desire expressed for student materials of specific courses that might be helpful to them. Media specialists appear to be almost essential in bringing course information to the attention of teachers. The need for information is ongoing and frequent.

Preferred approaches: This depends upon the subject to be presented, but on-location reality and/or dramatic formats appear to be most preferred by students. There is a trend toward the diminution of "super-production" techniques, with greater emphasis upon the learning that is to take place. Gimmickry is out. Greater consideration must be given to achievement of learning goals with efficient production techniques and budgets, as well as relevancy of production elements to the viewing students.

6. What ITV/Technology do you use or recommend for use to enhance/reinforce the current curriculum?

and

7. What ITV/Technology could be used to enhance or reinforce the current curriculum?

Teachers interviewed most often use film strips because of accessibility, ease of operation, and teacher control. Other than this preference, there are too many variables to give consensus statements about these two questions. Situations vary all the way from schools that receive no signal, experience building reception problems, or depend upon 20-year-old black and white sets to highly sophisticated statewide networks incorporating and maintaining open broadcast, closed circuit, cable, instructional television fixed service (ITFS) and satellitic up and down-links. Only one interviewee, however, would object to having a color TV monitor in each classroom with instant access to a videotape recorder (VTR) player upon request.

Some respondents would like to see tape libraries accessible in classrooms and/or school libraries. Others feel this is a waste of money, space, and study time and would prefer broadcast of programs (open or closed circuit) upon request for dubbing, use, and erasure. This can be accomplished by telephone request and dubbing between midnight and 6:00 a.m.

One thing was apparent from teachers interviewed: They do not want to make dubs themselves, but prefer a media specialist to handle all details. It was also reported in some areas that the economy is causing some school systems to dismantle large media centers. It was also apparent that the purchase of films and film equipment is diminishing. Media specialists want a minimum of two VTR's available at all times: one for dubbing and one for playback. Portable vidicon cameras for student and/or teacher use would be desirable, also.

The majority feel that open broadcast continues to be essential for an economical use of television. Open broadcast has its limitations, however, in terms of amounts and availability of air time. Where there is only local access to open broadcast, there is a growing perception that public television stations are gradually cutting back on the air time allotted to in-school programming.

Cable systems hold great potential for expansion of broadcast time, making possible multiple repeats of programs and increased amount of program series. Cable can be used for interactive participation on the part of the student. Currently, utilization of cable systems varies from superior to lack of knowledge about cable franchising. Where cable is available, there may be several different companies within the school community being served by ITV, thereby creating problems that are reportedly hard to resolve.

ITFS systems are being utilized more than ever before to fill in signal gaps within existing systems and to replace the increasingly costly land lines. ITFS, in combination with open broadcast and cable systems, is making possible the development of "mini-network consortia" among schools, school districts, regions, and the like.

Teletext, interactive cable, interactive videodiscs and microcomputers linked with ITV programming, all are envisioned as desired technology in the future. Although Direct Broadcast Satellite (DBS) service is at least a decade away, DBS is anticipated to be a positive factor in furthering the use of ITV/Technology. No matter how much new technology appears in the offing, these professionals continue to see the television monitor as the heart of every system.

8. How do you select the ITV/Technology you use?

This question must be answered in specifics for each situation, for selection varies from school to school, district to district, or statewide, depending upon the administrative structure and the funding source. It would appear that one generalization can be made: Equipping the local school has been an informal, local activity for the most part. Old black and white television sets are most prevalent, and there appears to be little concerted, organized effort to replace them.

In one instance, the Board of Education allotted $75,000 to buy a number of 19" color TV sets at large-lot wholesale prices. According to an established formula based on number of students, schools using ITV were given free sets. Schools committing themselves to ITV use the following year were able to buy sets at the cost price. Of those acquired by schools, 115 sets were given to schools, 141 were sold at cost, leaving a surplus of 85 to be given to participating schools the following year. The participation in ITV increased 71 percent.

The South Carolina Office of ITV and Radio is one of those that cites the replacement of old black and white sets as a major problem to be resolved as quickly as possible. And one West Coast interviewee exclaimed, "If this country can afford to have a color television set in every hotel and motel room, why can't we see fit to put one in every classroom?"

9. How should/could you select the ITV Technology you use that would be different from current practice?

The purchase of micro-computers is the technological fad of the day. In spite of stringent budgets that do not allow the expansion of television equipment purchase, computers are being placed in schools in the majority of areas served by those interviewed. The reason given for this is "Parents and the public view television as entertainment and computers as business. Therefore, there is money for the latter, but resistance to the former." A number of respondents wistfully added, "We need another NDEA (National Defense Education Act) to help us buy new sets."

Most of these professionals expressed concern for a possible repeat of unfortunate and disappointing experiences of the past when equipment was acquired without a thorough analysis of need, a limited amount of software (programming), and an over-expectation of its capabilities.

History appears to be repeating itself. Respondents feel there is an urgent need to acquaint educators with computer state-of-the-art, availability of computer programming, cost effectiveness in serving students, and careful analysis of need prior to purchase.

Having identified all these cautions, the majority of those interviewed see micro-computers as an enhancement and a further refinement of the instructional television equipment now in place. Some feel computers will motivate a resurgence of interest in, and use of, instructional television for learning purposes.

***

Additional Information:

At the beginning of each interview, the respondent was encouraged to address any facet of ITV/Technology regardless of whether or not it was covered in the questions posed in the study. Confidentiality was assured. Each interview was wrapped up with an open-ended question, "Is there anything else you would like to comment upon which has not been covered thus far?" Concerns and comments clustered around the topics that follow:

The Economy: Effects on Both Schools and ITV: As noted before, school budgets are being cut. Many people felt that the full impact will begin in 1983. In addition to scarce dollars, demographics show additional changes which will affect school budgets: more elderly citizens, more childless couples, more single-parent families--all factors which will impinge upon future tax revenues. ITV is seen as a way to assist schools in filling in the gaps resulting from staff dismissals, curriculum and counseling cutbacks, as citizens resist further taxation. In single-parent homes, ITV is seen as providing role models for children and as a standard of excellence in instruction for all students regardless of the economic status of the school system. Whether or not educators will grasp this opportunity led to the full range of speculation: from very pessimistic to very optimistic.

Instructional television services are also being affected by the economy. National and regional distribution costs are becoming line items in public television station budgets, and ITV income is expected to assume these costs. Production centers are diminishing in both staff and programming output as costs continue to rise. Public television stations are cutting back on ITV service staffs and the amount of broadcast time for school services at the very moment when, in the opinion of many interviewed, schools will call upon ITV to assist them in greater amounts than ever before.

To respond to current educational needs, ITV program series need updating. Curriculum gaps in the humanities and fine arts need to be filled, and new programming needs to be developed to fill identified areas of concern such as remedial courses for high school students, individualized instruction for the gifted and for the special education student, and the influx of students who must learn English as a second language.

The Future Organizational Structure of ITV: With the demise of the National Association of Educational Broadcasters and the uncertain future of PBS educational services, ITV professionals are exploring new organizational configurations. Many feel that the time has come for regional networks to combine forces, eliminate duplication, and build a nationwide cooperative support system. Others feel that a national presence at PBS is essential; still others feel that after a quarter-century of PBS/CPB service to schools, ITV must become the responsibility of the schools.

Problems That Continue to Persist:

1. ITV Awareness: There continues to be a perception on the part of the public and parents that TV is entertainment. ITV is equated with the Saturday morning commercial fare and is affected by the growing concern that children view too much

television. This leads to difficulties in gaining school board support. Many ITV professionals are placing emphasis on meeting with parent groups to try to combat this misconception. It will grow to be a harder task as more and more ITV programming is relegated to closed circuit and the public has no opportunity to view it. Teachers continue to be unaware of ITV program availability and current information about ITV. An awareness campaign continues to be needed and must be an ongoing activity.

The need for a national clearinghouse of information about ITV programming and services continues to be cited.

2. The role of ITV in the classroom: There is consensus that ITV has proven itself a valuable supplemental and enrichment resource to teachers. ITV has not been accepted as an integral part of the core curriculum: It still remains outside the activities of curriculum planning and supervising staffs. ITV is not being allowed to prove its value as an effective means of bringing wanted changes and innovation. One 15-minute lesson per week cannot do this job. Educators need to reexamine the impact of ITV in its earliest years when it was used to assume the primary responsibility for a course of study and for introducing new content and/or methodology. All are aware of the political ramifications of such a reexamination, and pessimism about it happening is more prevalent than optimism.

3. Staff development in the use of ITV/Technology: For the most part, teacher training institutions and certification

agencies continue to ignore ITV/Technology in preparing students who intend to pursue teaching careers. The ongoing costliness of having to provide this service once teachers are in the classroom was noted by many. Utilization specialists are spread too thin in even the best of circumstances, and ITV professionals continue to question why this responsibility has not been assumed by the schools themselves.

In spite of these concerns, those interviewed did not express any doubts about the continuance of instructional television services. Instead, there is a perception that ITV and the schools are at an important moment of decision-making. The future development of the potential of ITV is increasingly becoming the responsibility of the educational community. The current technology makes it feasible for this to happen now.

Interviews with National Leaders

With the exception of the representative of a large textbook company, all interviews with the national leaders were conducted on a face-to-face basis. It was a heterogeneous group whose responses do not lend themselves to numerical tabulation, so the summary is presented in narrative form.

The material on these interviews, after a brief general introduction, is organized under headings corresponding roughly to series of questions outlined above from the DFE survey concerned with immediate and longer range curriculum needs, utilization/communication, and technology in the schools, including the computer.

General Remarks

On the whole, the American public appears to be relatively indifferent to the impact of commercial TV upon itself and its children. Such TV is used, by and large, to sell rather than to inform, entertain or educate. There is more concern abroad about the effects of commercial TV than in the U.S.A., and the control of information across international borders is becoming highly politicized. At the same time, the power of the media in general in the United States is being recognized, as is evident in the fact that the Catholic bishops have bought considerable time on a communication satellite and are launching a ten-year production called "Visions and Values."

Meanwhile, local ITV development and production has an uncertain future. One reason is that the production of a quality product is extremely expensive both in terms of money and expertise. Fewer and fewer local stations can muster enough of either commodity. At the regional and national levels, the future of ITV is also cloudy. The Public Broadcasting Service (PBS) is moving away from the schools toward general audience programming, as money becomes more and more scarce and as the schools are able to carry less and less of the financial burden for their proportion of broadcasting time. To add to these troubles, the Corporation for Public Broadcasting (CPB) is having to cut out a big chunk of operating money that it traditionally supplied. Further, station managers and national TV people complain that school people are hard to work with, have many demands--according to the general audience programmers--and deal with boring material. At the same time, PBS reports that 60% of U.S. households now watch PBS programs.

There are also complaints that national bureaucratic procedures and guidelines tend to stifle creativity and that there needs to be more television expertise at the national level to complement other types of professional competence. There was a call from several sources for CPB to serve as a resource with respect to television know-how and as a more vocal promoter of television for school use. Also expressed was the hope that CPB could create a hunger in both schools and homes for "good" TV programs.

This appears to be a critical time for television and the schools. The role of national, regional, state, and local ITV operations is undergoing profound change, and CPB is called upon to assume a more active leadership role during this crucial period. It is evident that the quality of ITV can be excellent and that it can meet a real school need.

Immediate and Longer Range Curriculum Needs

Those who felt they were in a position to comment agreed that the present curriculum emphasis in the schools remains on basic skills, but that there is some movement toward critical and analytic thinking in reading as well as efforts in mathematics to move beyond computation toward problem solving in the lower grades and toward higher mathematics and science in the high schools. This latter effort is diminished by the growing shortage of competent math and science teachers, particularly at the high school level.

There seems to be a trend towards more mathematics in the high school, with calculus and analytical geometry in the high school to stay and probability and statistics making a new dent in the offerings at the end of the secondary school years. There is also considerable emphasis at present on programs for gifted and talented students, and a great need felt right now for better materials of instruction for gifted students at all levels.

Another immediate need that surfaced over and over was the need for computer literacy for teachers. There is evidently some work of this nature already going on and some indication that such courses could and would be designed and run by computer firms.

Political pressures appear to be building behind critical needs in the schools, specifically in higher mathematics and science. The future of our technological advance is at stake. There may be industrial interest and help for such critical needs.

With respect to needs in the next three to five years, foreign language was mentioned several times--as well as non-Western cultures and history, ethnographic and anthropological studies of all kinds, the history of ideas, the arts and humanities, including classical children's literature and visual literacy. There seems to be a trend toward cutting art and music as budgets get tighter.

Interestingly, the independent schools made a big pitch not only for short supplements for history, the humanities and the arts, but also for the "non-plumbing" sides of sex education and for help with the psychological needs of adolescents; i.e., problems of identity and related counseling as opposed to the academic/pre-college counseling on which their counselors concentrate. The Catholic schools are interested in value education.

On the length of programs, answers ran the gamut from 15 to 45 minutes, depending on the subject matter and the age of the audience. One of the technical specialists remarked that program lengths were too tied to broadcasting models--that new techniques like tape libraries and cable TV would make any length possible since the lengths could soon be more easily controlled by the teacher.

Those who spoke to the issue of ancillary materials felt that they were important for both students and teachers and that they needed to conform to the same high standards as the TV programs did, both in substance and form. The independent schools would be interested in flexibility--possibly in loose-leaf form or the like.

Many of the respondents talked about the importance of teacher education--not only about how to use telecommunications, including the computer, but also to bring to teachers up-to-date teaching techniques and research knowledge about the teaching process. The translation of research into language familiar to teachers is an important need in teacher education.

The independent schools feel a real need for teacher education materials which could be used by the curriculum committees in independent schools and which would fill holes in their knowledge not only of research in teaching and learning, but also in their knowledge of the state of the art in ITV, technology, present video tape resources, school use, and the potentials and limitations of telecommunications. The independent schools were particularly interested also in subjects for general audiences, such as studies of the children of the 80s, the transformation of the family, and social issues growing out of science and technology, like Love Canal, and the like. They feel the need for materials which can build bridges between generations. Thus, teacher education and adult education become curriculum focuses, as well as standard school subjects.

Utilization/Communication

School and school system climate are of great importance in the effective utilization of ITV. The demands on teachers' time are very great, and they tend to feel uncomfortable about technology which they have not had the opportunity to master. Hence, there is great need for easily accessible and foolproof machinery. Storage space is important, as are the human resources to serve as support to teachers, both mechanically and educationally. Technology should be "user friendly."

Teachers respond to materials which are directly related to the curriculums for which they are responsible, and they need time and the opportunity to review programs in advance. An ideal situation would be a resource or media center in each school, staffed with competent media resource persons whose task would be to assess, organize, and communicate with teachers about telecommunications products related to their curriculums.

Teachers must be involved in the process of adoption--be given an opportunity to make their own mistakes without embarrassment. Continuing support from the principal, the superintendent of school, and the board of education is important, as is regular staff development in the particulars of the utilization process. Some of the best teachers fear the dehumanization of technology.

A home market appears to be a necessary component in the sale and effective utilization of technology in the schools. Indeed, the schools seem to follow the home market rather than to create one. There were many complaints about the lack of communication between pieces of the school/ITV system. And it is true that many good programs go unused because no one knows about them. More effective communication is essential at all levels so that existing resources can be more fully used. There is duplication of effort between local public TV stations and between schools and school systems.

Re: Technology in the Schools, Including the Computer

Present day telecommunication hardware in the schools is mostly outdated. There is great need for integration of systems as well as more attention to compatibility between different parts of the technical system. Hardware replacement costs are high at a time when schools are generally short of funds. Several experts thought a new National Defense Education Act (NDEA) or its equivalent would be necessary to update school hardware.

On the other hand, there was considerable feeling that video cassettes could and should be a most useful instructional tool in the schools--that they would not soon be outdated by new technologies. There was a call for the development and marketing of catalogs of existing tapes so schools would have a better idea of existing resources.

Despite shortages of funds for ITV hardware, schools seem to be buying small computers or to be receiving them as gifts from parents. Commercial pressure to buy is heavy, as well as commercial promises that computers can and will revolutionize the schooling process. The computer expert at a large textbook company estimates that there are now 150,000 computers in the nation's schools, of which approximately 15% are in the elementary schools. He is concentrating developmental efforts at present on elementary reading and mathematics for primary grades. He sees three major uses of the computer for schools: namely, computer science, the computer as a tool for learning, and computer literacy.

Almost all of the respondents spoke of the need for computer literacy courses for teachers, and some noted that teachers were enthusiastically attending such courses on their own time. At the same time, the quality of the software was very much in question. Many saw courseware development for the computer as a tool for learning as in its infancy. Currently, most software consists of drill and practice programs. There is, however, considerable demand for high school computer science courses. These are the courses in which the computer is studied as an object of interest in itself and as beginning preparation for the kind of competence required of a computer professional.

Opinion about the future of computers in schools was mixed. It ranged from very positive feeling to concern that this is just another expensive new fad. Said one respondent about school reluctance, "There have been too many wagons over the cliff. The schools have been burnt before." Said another, "As computers become an extension of the human brain, they will have a chance of survival in the schools."

There was also concern about the future of the video disc in the schools. One interviewee noted that two large commercial companies had just stopped their manufacture because of uncertain home markets. Since he believes that the schools follow the home market, he thinks the video disc may not have all the school use and applicability that is claimed for it. Even if available, it requires a master teacher to profit from its potential. Another concern about general use in the schools is the matter of equity; that is, its availability to those who can afford to buy it (in both homes and schools) and those who cannot.

On the other hand, those knowledgeable about teaching noted that computer technology has a magic for children and young people and that computers have the capability of serving as a real link between home and school. There is surely a need for solid research on the question raised by one teacher; namely, "How long will it last as a learning tool, and what can it do for learning?" There is some research and experimentation now underway in the schools; more is required.

As to the selection processes for technical equipment across the country, the feeling was that it was largely irrational. About review and evaluation of programs and their eventual selection for school use, respondents were very sensitive to the increasing number of school book bans across the country, and think that a community-based commitment to content selection and evaluation, though bureaucratic and restrictive, is essential and important. Many schools have public evaluation and selection processes for both books and films.

Persons who were interviewed in the course of the study and whose views were especially helpful:

Mr. Hugh Atkins	ETV Consultant Greenville School District ETV Center Greenville, South Carolina
Mrs. Nancy Bauer	Instructional Coordinator Wisconsin Educational Communications Board Madison, Wisconsin
Ms. Lovely Billups	Assistant Director, Educational Research & Development Programs American Federation of Teachers Washington, D. C.
Mr. William Brady	Director of Instructional TV New Hampshire Public Television Durham, New Hampshire
Mr. John B. Bricker	Principal Eastside High School Taylors, South Carolina
Mr. David Britt	Vice President Children's Television Workshop New York, New York
Mrs. Barbara Campbell	Principal Mitchell Road Elementary School Greenville, South Carolina
Dr. Joseph R. Caravella	Director of Professional Services National Council of Teachers of Mathematics Reston, Virginia
Mr. Jon Cecil	Director, Elementary/Secondary Programming Public Broadcasting Service Washington, D.C.

Mr. Peter Chant	Director of Educational Services Eastern Educational Network Newton, Massachusetts
Mr. Edwin G. Cohen	Executive Director Agency for Instructional Television Bloomington, Indiana
Dr. Peter Craske	Director of Instructional Services KTEH San Jose, California
Mr. Paul Denn	Manager of Programming and Instructional Television California Public Broadcasting System Sacramento, California
Ms. Eunice Dickerson	Principal Crosswell Elementary School Greenville, South Carolina
Ms. Audrey Eddy	Utilization Consultant S.C. Office of ITV/Radio Greenville, South Carolina
Mr. Bert Edwards	TV Programming Technician San Diego County Department of Education San Diego, California
Mrs. Virginia Fox	President Southern Educational Communications Association Columbia, South Carolina
Dr. James Gates	Executive Director National Council of Teachers of Mathematics Reston, Virginia
Mrs. Marilyn Goodson	Librarian/Media Specialist Eastside High School Taylors, South Carolina

Mr. Mark Gorelzenko	ITV Coordinator KOCE-TV Huntington Beach, California
Mr. Clyde Green	Director Office of Instructional Television South Carolina State Department of Education Columbia, South Carolina
Ms. Anne Grey	Teacher: Grade 4 Crosell Elementary School Easly, South Carolina
Sister Suzanne Hall	Executive DirectorSpecial Education National Association of Catholic Education Washington, D.C.
Ms. Margaret Heavnor	Teacher: Grade 5 Mitchell Road Elementary School Greenville, South Carolina
Dr. Howard Hitchens	Executive Director Association for Educational Communications and Technology Washington, D.C.
Mr. Richard Jenisch	Principal McClellen School Rochester, New Hampshire
Mr. Louis Knight	Assistant Director National Association for Independent Schools Boston, Massachusetts
Dr. Twila Liggett	Assistant Director Great Plains National Instructional Television Library Lincoln, Nebraska
Mr. Ted Lucas	Vice President for Instructional Television Central Educational Network Chicago, Illinois
Ms. Donna Matson	President Western Instructional Television

	Los Angeles, California
Dr. Keith Mielke	Director of Research Children's Television Workshop New York, New York
Mrs. Dian Molton	Manager Department of Learning Services Pacific Mountain Network Denver, Colorado
Mr. Frank Norwood	Executive Director Joint Council of Educational Telecommunications Washington, D.C.
Ms. Bonnie Oliver	Deputy Director California Public Broadcasting Commission Sacramento, California
Ms. Mary Reed	Manager Educational Technology Unit California State Department of Education Sacramento, California
Representative	Large Textbook Publishing Co.
Dr. Elinor Richardson	Director of Educational Services WHY IN THE WORLD Series Satellite Educational Services Los Angeles, California
Dr. Sharon Robinson	Director of Instructional and Professional Development National Education Association Washington, D. C.
Ms. Marilyn Rauth	Director, Educational Issues American Federation of Teachers Washington, D. C.

Mrs. Martha Rupert	Librarian Easley High School Easley, South Carolina
Ms. Ruby Sawyer	English Teacher Eastside High School Taylors, South Carolina
Mrs. Clare Schooley	Director of Instructional Television KQED San Francisco, California
Ms. Frances Smith	Science Teacher Easley Senior High School Easley, South Carolina
Mrs. Gail Stevens	Teacher: Grade 2 Swasey School Brentwood, New Hampshire
Ms. Susan Taylor	Foreign Languages Teacher Easley Senior High School Easley, South Carolina

APPENDIX C

Concerns of the Analysis Panel

In the course of the meetings of the Analysis Panel, a number of concerns regarding the use of telecommunications in the schools were expressed by the experts gathered to consider the material in the position papers and in the interview summaries. These concerns are outlined below:

1. Promotion, Acceptance, Marketing

The value of television or other technologies for instruction is a well-kept secret.

- Efforts need to be mounted to call the particular attention of public decision makers (those who control the allocation of funds--legislators, school board members, local and state government persons) to the value and use of television/technology for instruction.
- Teachers need to be encouraged and assured by those decision makers that wise use of technology for instruction *is* appropriate.
- The public needs to be made aware of the respectability and validity of the use of technology for instruction so that they will not unduly criticize schools who use these instructional modes.
- *Evidence* of effective use of television/technology for instruction needs to be called to the attention of decision makers and the public. This effort should

include reporting test results, if appropriate, indicating students' academic and skills growth because of the use of technology. Evidence of the efficiency and quality of the technology needs to be brought forward.

2. Value of Instruction via Telecommunications

- Instructional television/technology can help fill a void in instruction which is caused by serious cutbacks in funding for schools; i.e., art, music, career guidance, study of the humanities, languages, mathematics, and science.
- The use of quality materials will keep before the public the recognition that these areas of learning simply can't be written off as unnecessary--they are essential for students.
- There is an urgent need for national policy statements endorsing the value of technology for instruction and for diagnostic/prescriptive skills work.

3. Curriculum Needs

Television could address special and urgent curriculum needs perhaps more effectively than any other medium. Examples of those urgent needs are:

- material for non-English speakers;
- programming to acquaint students and adults with civics and the importance of citizen participation in government;
- an update for adults of the importance of schools and schooling in the United States;
- staff development--programming to help teachers become aware of new research in learning and teaching and to provide updated information in math, science, social studies, and economics.

4. Other Major Issues

- Accessibility of television/technology for schools and teachers

  In spite of all the efforts made in recent years to bring the technology to the schools, there is still enormous work to be done in this area.

  Implementation of Technology in Schools

  - How shall teachers learn to use technology?
  - Will the public understand the value?
  - Can "everything" be taught via television/technology?
  - How can decisions be made about what should be cut from the curriculum or extra-curricular activities to make room for instruction via television/technology?

CORPORATION FOR PUBLIC BROADCASTING/DESIGNS FOR EDUCATION

ANALYSIS PANEL

Craig Phillips
Supt. of Public Instruction
Raleigh, North Carolina

Lyndon Courter
Director of Curriculum
San Diego Unified School District

Pauline Rauh
Principal, Roxbury School
Stamford, Connecticut

Keith Mielke
Executive Director of Research
Children's TV Workshop
New York, New York

Mary Lou Ray
Director of Learning Services
KRMA, Channel 6
Denver, Colorado

Wayne Puckett
Coordinator, Instructional TV
WDCN-TV, Channel 8
Nashville, Tennessee

James Jacobs
Supt. of Public Schools
Cincinnati, Ohio

Glory Bradbury
Teacher, Wright Jr. High School
Los Angeles Unified School District

Joan Grossman
Primary Teacher
Concord Public Schools
Concord, Massachusetts

Barbara T. Howell
Executive Editor, Textbooks
Whippany, New Jersey

Kenneth Murr
Director of Educational Services
Catholic TV Network of Chicago
Chicago, Illinois

Management Team

M. Virginia Biggy
Marilyn Deraney
Gary Griffin
Rhea Sikes
Elizabeth C. Wilson

Representing CPB

Peter Dirr
Mary Sceiford
Meg Villarreal

APPENDIX D

Background - DESIGNS FOR EDUCATION Management Team

M. Virginia Biggy, Ed.D., is President of DESIGNS for EDUCATION and Project Manager of the study. Dr. Biggy has long experience in public education as a teacher, principal, curriculum director, assistant and superintendent of schools. She has also been closely involved with teacher education programs at Tufts University and now is Professor of Education and Dean of the College of Education at the University of Lowell, Massachusetts.

Dr. Biggy is the national consultant for the major television curriculum effort being managed by the Agency for Instructional Television: Skills Essential for Learning and for the Great Plains National/WNED, Buffalo, project Reading Rainbow.

Her interest in television/technology is also of long standing--since 1955 as a member of the Curriculum Committee for the 21" Classroom in Massachusetts and from 1962-67 as Director of Instructional Television for the Eastern Educational Network.

***

Marilyn F. Deraney is an Assistant with DESIGNS for EDUCATION. She has a strong background in teaching at the junior high school level and is particularly interested in literature for young adults and in the uses of media for instruction. Ms. Deraney is active in state and local politics; she is a Justice of the Peace; she was graduated cum laude from Bates College in Lewiston, Maine, and has a master's degree in education administration from the University of Lowell.

***

Gary Griffin, Ed.D., is an Associate of DESIGNS for EDUCATION in Teacher Education and Curriculum Development. Dr. Griffin has served as a teacher, curriculum director, researcher, and as a professor of curriculum at Teachers College, Columbia University. He is currently Coordinator of Research in Teacher Education at the Center for Research and Development in Teacher Education at the University of Texas in Austin, and in that role manages a massive on-site classroom study of apprentices and their master teachers. He is the editor of Staff Development, the 1983 Yearbook of the National Society for the Study of Education.

Dr. Griffin is well-known for his work in establishing criteria for evaluating teachers and also for developing much needed decision making and evaluation systems for national curriculum pursuits.

***

Rhea G. Sikes, M.A., is an Associate of DESIGNS for EDUCATION with a specialty in instructional television. Miss Sikes has the distinction of being the first person to develop and direct an instructional television service in this country--at WQED in Pittsburgh. She served as Director of Educative Services for the Public Broadcasting Service and is now an international consultant in television for instruction for children as well as adults. Her most recent study of children's programming for the Corporation for Public Broadcasting is a landmark historical review and serves as a sorely-needed base for future planning of television for children.

Miss Sikes is the recipient of many awards as a television producer and recently received the Distinguished Service Award of the National Association of Educational Broadcasters' Instructional Council.

***

Elizabeth C. Wilson, Ed.D., is an Associate with DESIGNS for EDUCATION with a specialty in educational planning and curriculum development. Her experience is a blend of the theoretical and the practical: She has taught in demonstration schools in Chicago, served in the Navy, had major curricular development responsibilities in Korea, and, as Director of Curriculum and Supervision in the Montgomery County, Maryland, Public Schools, was a leader in curriculum reform in the school system and as consultant to other organizations.

Dr. Wilson continues to be sought as a contributor to or consultant on major studies and reports on curriculum reform in the United States. Her most recent written work includes contributions to Curriculum Inquiry and to Education for the 80's--Curricular Challenges.

***

Corporation for Public Broadcasting
1111 Sixteenth Street N.W.
Washington, D.C. 20036